

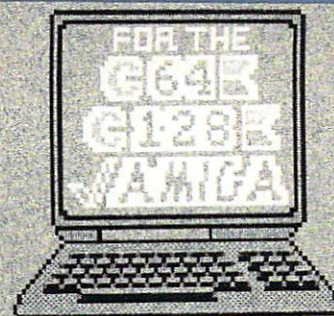
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INFO

The useful guide to commodore computing!



INSIDE THIS ISSUE

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 - ◇ Game Gallery
 - ◇ ERG=CARDS

-
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 - ✓ T-Disk
 - ✓ A-Time
 - ✓ The Musical Amiga

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City State Zip

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— Computer Entertainer
C-64 & 128.



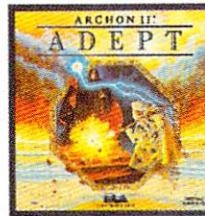
SEVEN CITIES OF GOLD™

Play Conquistador in this educational adventure of history and geography.
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Apple // family, C-64 & 128, Atari, IBM PCjr, PC, and comp.



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ARCHON II: ADEPT™

Graduate school for Archon addicts. Even more strategy and magic.
"Best Strategy/Arcade Game"
— Family Computing
Apple // family, C-64 & 128, Atari.



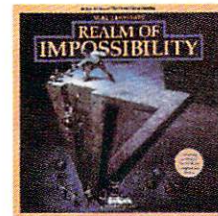
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New. Like an "Archon Construction Set."
"Best Construction Set"
— Family Computing
C-64 & 128.



MOVIE MAKER™

Create your own high-quality animated movies.
"A masterpiece."
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Apple // family, C-64 & 128, Atari.



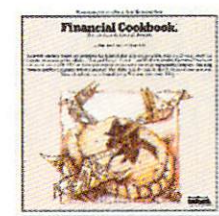
REALM OF IMPOSSIBILITY™

Action and adventure in a world of Escher-like illusions. Includes a unique 2-player cooperative mode.
C-64 & 128, Atari.



M.U.L.E.™

The best multi-player computer game of all time.
"Best Strategy Game" — Infoworld
"Best Multi-Player Game"
— Electronic Games
C-64 & 128, Atari.



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ELECTRONIC ARTS™

INFO

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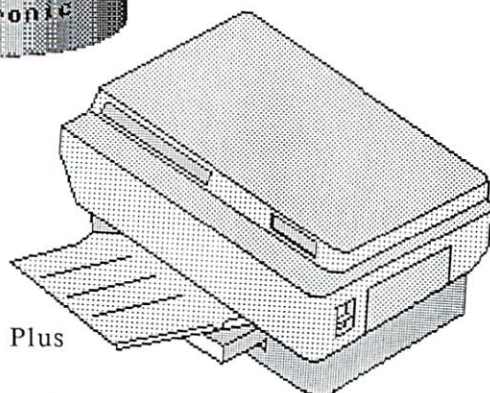
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INKWELL SYSTEMS

COMPUTEREYES™
by:

■■■■■DIGITAL VISION■■■■■



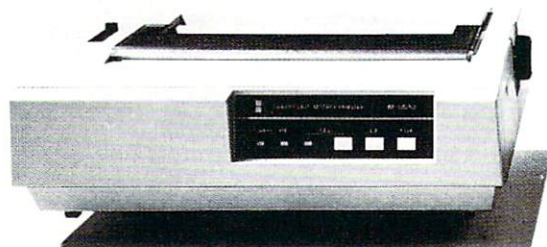
VIZAWRITE
PERSONAL WORD PROCESSOR



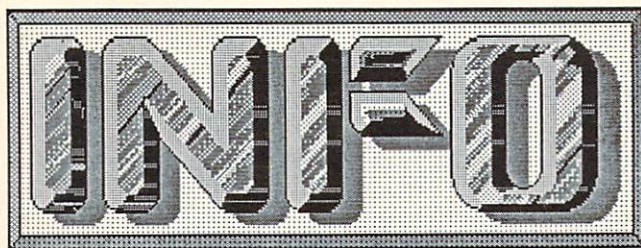
HP LaserJet Plus



Star SR-15
dot matrix



C.Itoh M-8510
dot matrix



#10

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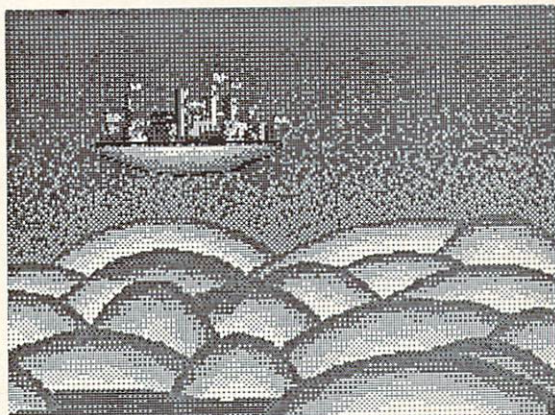
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ALSO IN THIS ISSUE...

ERG-CARDS for AmigaDOS, Elite, and VizaWrite!



ABOUT THE COVER

No, it's not a photo of INFO's international headquarters floating over the Iowa corn fields: Issue #10's cover photo is a fantasy scene by Greg Johnson titled "Castles", and created on an Amiga with Electronic Arts' exceptional *DELUXE PAINT* program.

Greg is half of the creative duo behind the stunning and much published demo pictures on Electronic Arts' Amiga *DELUXE PAINT* disk ("PaintCan", "StarFlight") and the author of many of the screens from EA's Amiga game titles.

Greg's partner in visual bedazzlement, Avril Harrison, is equally talented: her "KingTut", and "Venus" demo pictures on *DELUXE PAINT* are absolute show-stoppers!

From what I have seen, Greg & Avril are two of Electronic Arts' most potent secret weapons!

We are proud to have an original "Johnson" for our May/June cover, and look forward to more great works of art from the Johnson-Harrison's!

(PS: INFO's new logo was also designed and rendered with Deluxe Paint, by yours truly. Hope you like it. We will be looking at several graphics products for the Amiga in the near future. -BD)



the **EDITOR'S PAGE**

INFO UPS AND DOWNS

INFO has experienced several ups and downs since the last issue was printed. A brief explanation follows:

UPS: Many of the "ups" should be apparent from a quick look thru issue #10. We have changed (improved) our look (*again!*) both on and in between the covers. The new cover reflects our affection for Amiga graphics (can you really blame us?), while our laser-printed interior reflects our desire to provide readers with clearer, easier to look at pages while remaining true to our philosophy of producing every square inch of INFO editorial space exclusively with Commodore, Amiga, and related third-party consumer-grade hardware and software. With the acquisition of a laser printer (HP LaserJet Plus), some new wordprocessing software (Vizawrite from Solid State Software), and great Amiga graphics tools like Deluxe Paint from Electronic Arts, we have been able to take some important steps in INFO's continuing evolution.

Not as visible, but just as important was moving our office (again) to allow for better organization and environmental control (you know how touchy this equipment can be.) So, we are out of the chicken shack (a moment of silence please) and back into civilized territory.

We have also upgraded our database setup to Superbase C128 running on some vintage CBM 8250 dual 1 megabyte drives. This should give us greater database reliability as well as save some time managing subscriptions and cataloging products.

DOWNS: The "downs" are basically the flip side of the "ups": This is the first issue we've shipped since early January! (so don't worry, you didn't miss the "Feb./March/April" issue- it just became the May / June.) All of our moving and improving cost us weeks more time than we had estimated. Again, I hope Issue #10 was worth the wait. We really hope to get these issues out every 2 months from now on.

KEEP IT COMPATIBLE!

I am really heartened by the fact that AEGIS, the makers of *IMAGES*, a paint program for the Amiga, decided to use the IFF picture file format established

by Electronic Arts as a would-be standard for all Amiga graphics files. This move is as wise as it is unusual in the software industry, and will benefit both Aegis and the consumer immensely. The consumer is benefitted in that he/she can create screens on one system and then either share them with someone who prefers or already owns the other system, or use both packages on the same project, taking advantage of the combined features of both programs! No one should have to worry about the format of their creations (this applies to wordprocessing documents and database & spreadsheet info too!), just the creation itself. This helps the software companies too: people will still buy the program that best seems to initially fit their needs, but instead of choosing sides (like Beta vs VHS), consumers will be more likely to buy a second product as a compliment to the first. In addition they won't be constricted by the fear that what is made with one product will become useless should that product's format become obsolete or discontinued.

I only hope other software vendors take note, and **KEEP THOSE FILES COMPATIBLE!!!**

HEADS IN THE SAND

I spoke with a VP at Commodore a couple of weeks ago, and was shocked to hear him tell me that Commodore is so unconcerned about Atari's ST computer that the subject isn't even discussed. He also told me that none of their 1000 or so Amiga dealers had expressed any concerns about ST vs Amiga sales! At INFO, we know the Amiga is a superior machine, but we also know that the ST cannot be swept under the rug so easily. We have talked to several dealers who sell both, and report from 5 to 12 times the ST's being sold as Amigas. We feel that Commodore/Amiga needs to wake up, maintain the new price cuts, and focus on performance and capability issues in their advertising. It's fourth down and inches- no time to be smug!

-Benn Dunnington



Dear INFO,

Here I was, on the verge of subscribing to INFO, when I read your backhanded, discouraging comments about the Commodore 128. Forget it, guys, at least for the time being. I had always enjoyed INFO, since I considered it one of the most garbage-free of the many publications dealing with the Commodore computers. However, I now find that INFO, after months of hype about the 128, now reacts with a stifled yawn.

And what has replaced the 128 in the hearts of the INFO staffers? Why, obviously, the Amiga--the new overpriced yuppie enticer from those merchandising wonders in West Chester, PA.

Let me tell you something: like millions of others, I started out in computing with a C64; it was only logical to move up to the 128. It is a great machine for the money, and its CP/M mode provides an excellent means of entering the realm of serious programming--after all, DOS is only a step away.

There is also nothing wrong with 8-bit machines. Indeed, programs for these computers are usually models of elegance because there is not enough memory to support those big, fat, self-indulgent programs so highly prized by the three-piece-suit set. In some ways, I feel, lack of memory capacity is an esthetic advantage. (Consider Chinese painting: less is more.)

You may be correct in stating that the 128 will be the last of its kind. But those of us who use the 128 (and the 64) on a daily basis will be around for a long, long time. And we will not be spending our information dollar on INFO--in fact, it might not be a bad idea for you to change your publication's name. I'd suggest Amiga World, but I think that one has already been taken.

Raymond R. Hanson, Jr.
San Diego CA

P.S. Before I'd buy an Amiga, I'd buy an IBM or one of its clones. Software is at least available for these machines.

Raymond, you really read us wrong on this one. If you reread the article carefully (P.25, issue #9), you will find that we not only praise the C128 as a fine machine, and recommend it as a good value, but predict that it will be around and selling well for a couple of years yet, at least. We still use C128s for 80% of the work we do around here. As for our love affair with the Amiga, we pleadd guilty. The price is going to drop soon on this and other sixteen-bit machines, bringing them within range for most consumers. And the power they deliver is many times what an 8-bit computer can give you (though, as you point out, it's possible to write bad programs on any machine.) The demise of 8-bit computers is a little like the death of steam trains. Steam built the railroads, and the changeover to diesels was met with much nostalgic outcry, but it was inevitable. The same is true with the switch from 8 to higher-bit cpus. We love our C64s and C128s, and use them every day; they are reliable workhorses. If you examine the pages of this issue, you will find lots of C64 and C128 coverage, and it will stay that way for as long as we can forsee. But no matter how much anyone may want to deny it, the Amiga is the inevitable, undeniable, future of Commodore computing. - Mark & Benn.

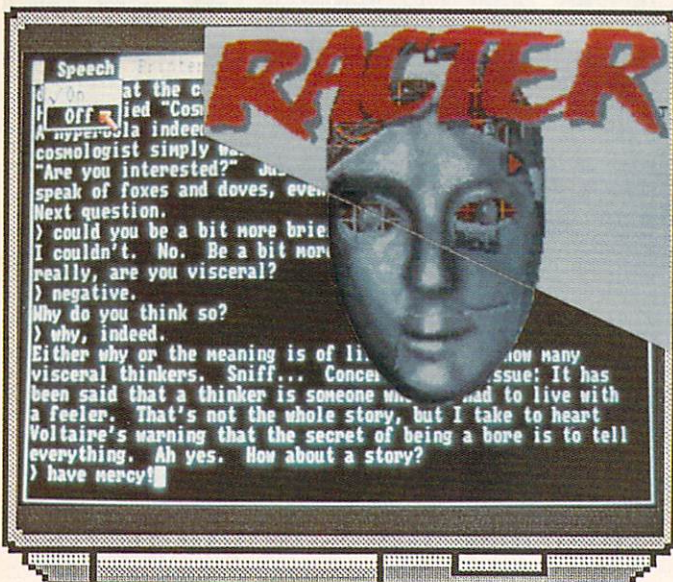
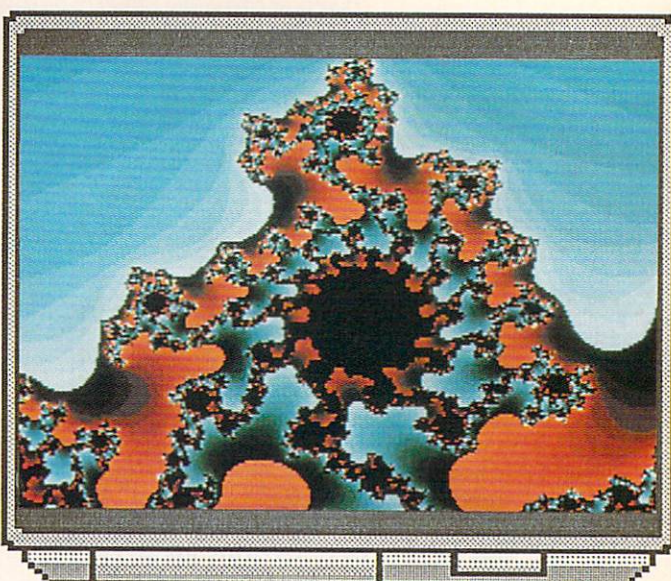
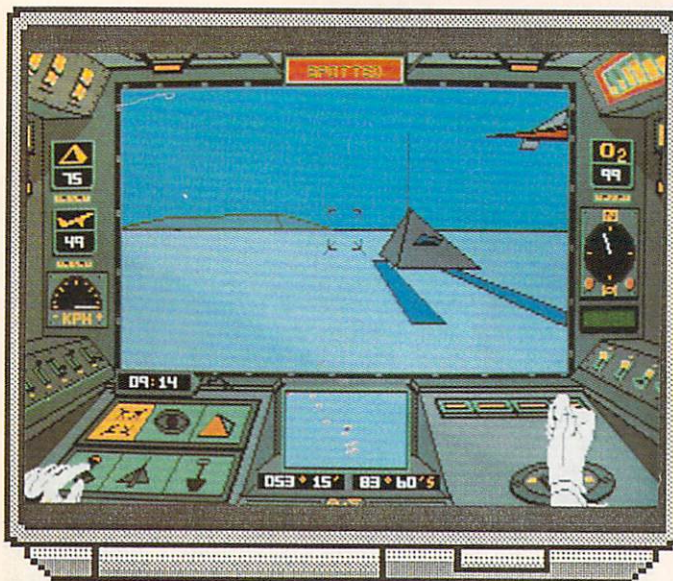
Dear INFO,

I have an Amiga BASIC program (under 200 lines) fit for publication. The program was written by a 16-year-old boy (with only C64 experience) on my Amiga. He calls it Doodle. I will trade this program for an Amiga system (512K Amiga, hires monitor, 2 drives, printer, and 100 Memorex 3.5" microdisks) for the boy.

Name Withheld

Not a week goes by that we don't hear from someone with the greatest program, product idea, etc., in the world, that they are willing to trade for "just" a complete \$3000 computer system, or \$10,000 cash, or something. Folks, it doesn't work that way. Even the "big" magazines will only pay you a couple of hundred bucks for a full article. Almost all the freelance writers we work with have full-time "day jobs", too. Even we big-time editors only make about as much as your average wage earner (we just have a better time doing it). -Mark & Benn

continued on pg. 16



AMIGA

GALLERY

ARCTIC FOX

★★★★

ELECTRONIC ARTS (DIST.)
2755 CAMPUS DRIVE
SAN MATEO, CA 94403

HERE IS A REAL BARN-BURNER OF A GAME THAT BEGINS TO SHOW WHAT THE AMIGA CAN DO WHEN IT IS UNLEASHED AS A GAME MACHINE. SMOOTH ANIMATION, CONVINCING COLORS, 3-D SOLIDS GLIDING BY, SOUND EFFECTS THAT WILL HAVE THE NEIGHBORS DUCKING FOR COVER! I DIDN'T GET CLOSE TO WINNING THIS GAME, BUT I HAD A BALL BLASTING ALIEN JETS & GROUND CRAFT WITH MY ARCTIC FOX TANK!! THAT SMALL WINDOW IS A VIEW SCREEN FOR YOUR GUIDED MISSILES THAT PUTS SOME DEDICATED FLIGHT SIMULATORS TO SHAME. WOW!

-BD

MANDELBROT (FREWARE)

★★★★

ROBERT S. FRENCH
2740 FRANKFORT AVE.
LOUISVILLE, KY 40206

IF YOU HAVE AN AMIGA AND A SPARE TEN OR FIFTEEN BUCKS, WE SUGGEST YOU GO TO THE POST OFFICE RIGHT NOW AND MAIL HIM A BLANK DISK AND YOUR CASH (IT'S WORTH IT). ROBERTS MANDELBROT "CONSTRUCTION KIT" ALLOWS YOU TO EXPLORE THE BREATHTAKING WORLD OF MANDELBROT SELF-SQUARED DRAGONS IN 4096 COLORS! THE LATEST VERSION (WE ARE STILL WAITING FOR OURS, BOB) IS FASTER, AND REPORTEDLY DOES A PSEUDO 3-D GENERATION OF THE MANDELBROT NUMBER SET. A MUST-HAVE!

-BD

RACTER

★★★★

MINDSCAPE
3444 DUNDEE ROAD
NORTHBROOK, IL 60062

RACTER WILL INEVITABLY BE COMPARED TO IT'S FORERUNNER, ELIZA, AND INDEED THE TWO ARE VERY SIMILAR. RACTER HAS A LARGER BASE OF LANGUAGE, WORDS, AND DATA, BUT THE OVERALL EFFECT IS JUST ABOUT THE SAME. STILL, THIS IS A FAIRLY AMUSING EXPERIMENT IN A VERY INTERESTING FIELD. OF COURSE THE USE OF THE AMIGA'S BUILT-IN SPEECH SYNTHESIZER ADDS ALOT, BUT EVEN SO, A LITTLE RACTER GOES A LONG WAY. OPTIONS TO PRINT THE TRANSCRIPT AS IT DEVELOPS, SO YOU CAN AMUSE (OR BORE) YOUR FRIENDS LATER. -BD

IMAGES

★★★★

AEGIS DEVELOPMENT
2210 WILSHIRE BLVD. STE. 277
SANTA MONICA, CA 90403

IMAGES IS ONE OF TWO HEAVYWEIGHT CONTENDERS IN THE AMIGA PAINT PACKAGE CONTEST (I'M RULING OUT AMIGA'S OWN 'GRAPHICRAFT'). THE RANGE OF EFFECTS AND RESULTS YOU CAN ACHIEVE WITH THIS PRODUCT IS VERY IMPRESSIVE. THE DITHERING, ANTI-ALIASING, AND WASH ROUTINES ARE STUPENDOUS! THE EFFECTS ARE THE STRONGEST POINT, WITH SOME WORK STILL NEEDED ON BASIC WORKING TOOLS. IMAGES IS BUNDLED WITH A GREAT ANIMATION PROGRAM, 'ANIMATOR' THAT MAKES THIS AN UNDENIABLE VALUE. LOOK FOR AN IN-DEPTH REVIEW SOON.

-BD

MINDSHADOW

★★★★

ACTIVISION
PO BOX 7287
MOUNTAINVIEW, CA 94039

A NICE GRAPHIC ADVENTURE GAME, MINDSHADOW USES THE EFFECTIVE "WINDOW WITHIN A SCREEN" TECHNIQUE TO MAXIMIZE THE SPEED, VARIETY, AND QUANTITY OF GRAPHICS SCENES. PLAYERS MAY USE EITHER THE MOUSE OR THE KEYBOARD TO NEGOTIATE THEIR WAY ABOUT THE ADVENTURE (I FIND THE KEYBOARD STILL MAKES THE BEST SENSE.) EXTRA APPLAUSE HERE FOR THE SMOOTH-SCROLLING TEXT-SOMEDAY ALL GRAPHIC ADVENTURES WILL BE MADE THIS WAY!

-BD

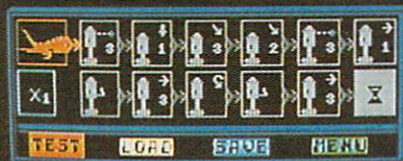
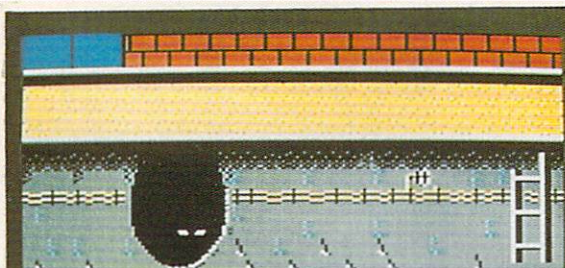
DIGIVIEW DIGITIZER

NA

DIGIVIEW
701 JACKSON STE. 3B
TOPEKA, KS 66603

ANYONE WHO HAS SEEN THE DEMO PICTURES CIRCULATING NOW THAT WERE MADE WITH THIS PRODUCT (AND THAT'S ALL WE'VE SEEN SO FAR) HAS TO BE IMPRESSED (AND WE CERTAINLY ARE!) THIS DIGITIZER PRODUCES BROADCAST OR BETTER QUALITY STILL IMAGES IN LO-RES, HI-RES, 128-LEVEL GRAY-SCALE, OR 4096 COLORS. THE DIGITIZER CAN USE A VARIETY OF 2:1 INTERLACE BLACK & WHITE CAMERAS (THE COLOR SCREENS REQUIRE THREE PASSES WITH FILTERS.) WE HOPE TO BE USING THIS SYSTEM EXTENSIVELY AT INFO IN THE FUTURE.

-BD



The Ward's Tale

SAMSON swings at a Mercenary, and hits for 8 points of damage.

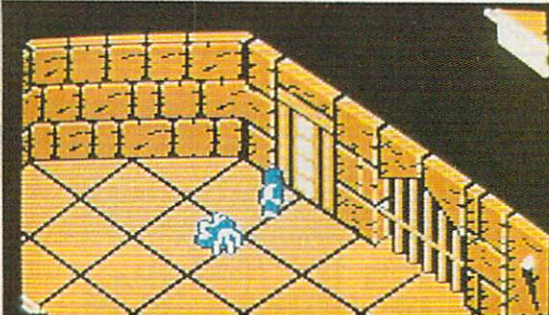
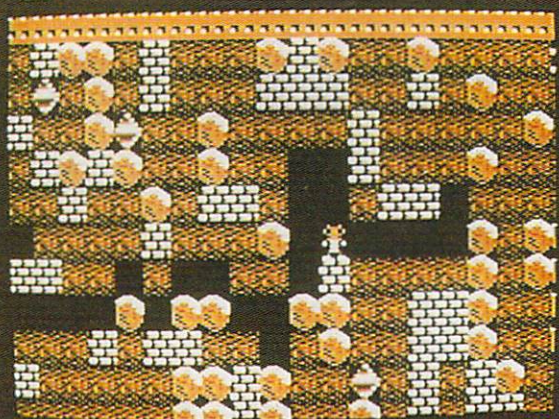
You still Face 2 Mercenaries.

Will your stalwart band choose to (F)ight or (R)un?

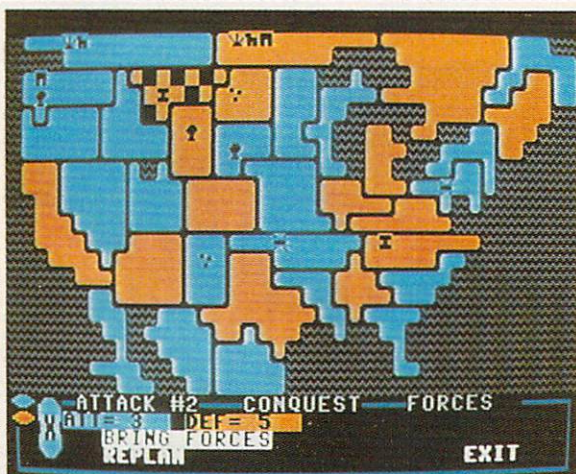
Mercenaries

	Character Name	AC	Hits	Cond	SpPt	CI
S)						
1)	BRIAN THE FIST	10	30	12	0	Pa
2)	SAMSON	3	28	28	0	Na
3)	EL CID	20	19	19	0	Bo
4)	MARKUS	24	24	24	0	Ro
5)	NEALIN	16	16	16	20	Co
6)	OMAR	9	20	20	14	No

24 15 05 116 001107



ENERGY	HITS	FIND IT FIRE BALL FIRE BALL NEAL
55	00	
SCORE	ROUNDS	
000000	10	



ATTACK #2 CONQUEST FORCES
WAVE 3 DEF 5
BRING FORCES
REPLAN EXIT



LIVES
3
SCORE
001%

MR MICRO

64/128

GALLERY

FLOYD THE DROID

***+

RADARSOFT / ACK INC.
655 JOHN MUIR DRIVE #E411
SAN FRANCISCO CA 94132

'FLOYD' IS AN INTERESTING GAME WHICH IS SORT OF A CROSS BETWEEN 'CHIPWITS' AND 'IMPOSSIBLE MISSION'. PROGRAMMING FLOYD IS THE BEST PART: YOU DESIGN FLOYD'S PROCEDURES FOR DEALING WITH THE DENIZENS OF THE WORLD'S GREATEST SEWER SYSTEMS, THEN WATCH THE FUN AS FLOYD JUMPS, DUCKS, AND ZAPS RATS, BATS, ESCAPING CONVICTS, AND SEWER SLIME! 500 SMOOTH-SCROLLING "3-D" SCREENS AS WELL AS PROGRAMMING AND AUXILIARY SCREENS. MANUAL, AUTOMATIC, AND SEMI-AUTO MODES. JOYSTICK CONTROL. -BD

THE BARD'S TALE

ELECTRONIC ARTS
2755 CAMPUS DRIVE
SAN MATEO, CA 94403

WITH ITS 16 MAZES, 85 SPELLS, 400 K OF MACHINE LANGUAGE CODE, AND NUMEROUS ANIMATED SEQUENCES, THIS NEW ENTRY INTO THE ANIMATED ADVENTURE GAMING WORLD SHOULD BE A BEST SELLER FOR SOME TIME. 'BARD' COMES CLOSEST TO THE FEEL OF THE ORIGINAL NON-ELECTRONIC FANTASY ROLL-PLAYING GAMES, BUT WITH THE ADDED ADVANTAGE OF HAVING YE-OLDE-C64 TAKE OVER THE DRUDGERY OF DUNGEON-MASTERING. I'M GLAD TO SEE THE SMALL INSET GRAPHICS WINDOW CATCHING ON- IT IS THE ONLY SENSIBLE WAY TO HANDLE ADVENTURE GRAPHICS. -BD

SUPER BOULDER DASH

***+

ELECTRONIC ARTS
2755 CAMPUS DRIVE
SAN MATEO, CA 94403

DECEPTIVELY SIMPLE, & STRANGELY ADDICTIVE SEQUEL TO FIRST STAR'S ORIGINAL 'BOULDERDASH'. THE CHARM OF THIS GAME LIES IN ITS TREATMENT OF THE LOGIC AND LAWS OF SIMPLE CAUSE AND EFFECT: DIG BENEATH BOULDER- BOULDER FALLS: STAND BENEATH FALLING BOULDER- YOU GET CRUSHED (NOT UNLIKE THE ARCADE HIT, 'DIG-DUG'). LARGE MAZES ARE NEGOTIATED VIA SMOOTH-SCROLLING SCREEN. 16 CAVES TO EXPLORE FILLED WITH DIAMONDS AND SURPRISES (SOME DEADLY). A GOOD TIME SUITABLE FOR ALL AGES. -BD

SPELL OF DESTRUCTION

***+

MINDSCAPE INC.
3444 DUNDEE ROAD
NORTHBROOK, IL 60062

THIS IS THE BEST TITLE I HAVE SEEN FROM MINDSCAPE TO DATE. ITS STRONG SUITS ARE THE "3-D" GRAPHICS, & THE "MOTION PICTURE" MUSICAL SCORE THAT CHANGES WITH THE ACTION. THE SOLUTIONS TO THE SUCCESSIVE PUZZLES SEEM UNCOMMONLY DIFFICULT, AND THE AIMING OF WEAPONS AND SPELLS SEEMS VERY TOUCHY. THESE TWO ASPECTS MAY FRUSTRATE CASUAL GAMERS WHO WOULD OTHERWISE FIND 'SPELL' A FIRST-RATE DIVERSION. DEPENDING ON YOUR PATIENCE, 'SPELL' COULD EITHER MAKE YOUR DAY, OR RUIN IT. -BD

LORDS OF CONQUEST

ELECTRONIC ARTS
2755 CAMPUS DRIVE
SAN MATEO, CA 94403

IF YOU LIKE THE BOARD GAME, 'RISK', YOU WILL LOVE LORDS OF CONQUEST! TAKE THE BASIC HIT GAME OF GLOBAL CONFLICT AND THEN ADD SEA TRANSPORT, WEAPONS & RESOURCE MANAGEMENT TRADING, VARIABLE CHANCE LEVELS, YOUR CHOICE OF SOME TWENTY DIFFERENT MAPS (OR DESIGN/EDIT YOUR OWN!), PLUS OPTIONAL COMPUTER ANALYSIS OF YOUR SITUATION (PREVICAMENT?) AT ANY POINT IN THE GAME, AND YOU HAVE 'LORDS', ABSORBING, FAST-MOVING, PRIME. 1-4 PLAYERS. TYPICAL GAME LASTS 45 MINUTES. -BD

WILLOW PATTERN

FIREBIRD
PO BOX 49
RAMSEY, NJ 07446

THIS IS PART OF A TWIN-PACK. (THE 'FLIP SIDE' IS 'CHIMERA', A ROBOT-IN-A-MAZE GAME). WILLOW PATTERN IS A PLEASANTLY ANIMATED AND SCORED QUEST INVOLVING THE RESCUE OF AN ORIENTAL PRINCESS FROM AN EVIL MANDARIN. LOTS OF SWORD-PLAY AND TREASURE IN THIS FAIRLY STANDARD RECREATION. CHIMERA IS AN EQUALLY ROUTINE 3-D MAZE GAME (ONLY THE 3-D EFFECT OFTEN OBSCURES THE PLAY, AND CONFUSES THE SITUATION.)

-BD

ANALOG RGB MONITORS

panasonic
dt-m140

deLuxe
pAINT

magnavox
cm8515

deLuxe
pAINT

composite

deLuxe
pAINT

amiga
a1080

deLuxe
pAINT

Atari
SC 1224

deLuxe
pAINT

Sony
KV-1311

deLuxe
pAINT

MONITOR ROUNDUP

HOW TO PICK A MONITOR

The monitor you need depends on which computer you own.

Commodore 64 owners need an inexpensive color composite monitor. You can use a standard composite monitor, but a monitor with separate **chroma** and **luminance** inputs will give you a much sharper C64 display than one with just standard composite input. It really is worth shopping for separated input, since the price of these units is comparable to the composite monitors anyway. If you are planning on upgrading to another computer later, or want to use it with your VCR, too, get one with both composite and separated inputs.

If you have a Commodore 128, you can get by with a composite monitor for 40-column, or a monochrome monitor for 40 and 80 column work (though you will have to use a custom cable, now available from several third parties, to hook it up, since the 40 and 80 column outputs come out of separate connectors on your C128). Ideally, though, you will want a digital (not analog) RGB color monitor with switchable separated video inputs to make full use of your 40 and 80 column color modes. Again, separated video is better than composite input. Also look for a composite/RGB switch on the front of the monitor. Some may have them hidden on the back, and since you will definitely be using both 40 and 80 column displays, you will want the switch to be handy.

You may want one with a text switch, which switches your screen to a green monochrome for business applications.

Amiga owners can use just about any monitor made and get some kind of a display. The composite output of the Amiga is not separated, so a standard composite monitor is fine if you can't afford an expensive analog RGB monitor. You can also feed the composite line to a monochrome monitor, but what a waste! A digital RGB monitor, such as you would use with the IBM/PC or C128, is, in our experience, a real disappointment on the Amiga. The color set of most of these monitors is limited to just sixteen colors, far short of the 4096 the Amiga is capable of producing. And the sixteen you do get are often almost unusable with the Amiga. In our opinion, the only two choices for Amiga use

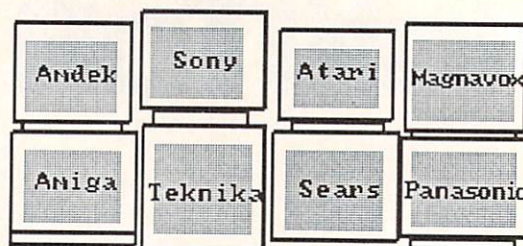
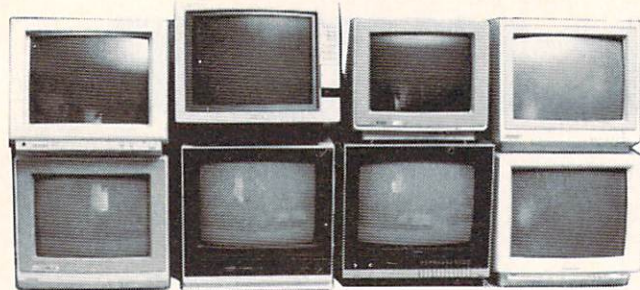
are an inexpensive color composite monitor (which will generally give you surprisingly good results) or a much more expensive analog RGB monitor.

The Amiga produces stereo sound, which no monitor we've seen will handle (though Commodore is supposedly working on one). You can get by by using a Y connector to mix the two outputs together and feeding that into your monitor, but we strongly suggest investing in a stereo amp and speakers, or at least a "boom box" with external inputs, so you get the stereo effect. The sounds from some of the Amiga games and music programs will blow you away, but not if they emanate from a tinny 2" monophonic speaker.

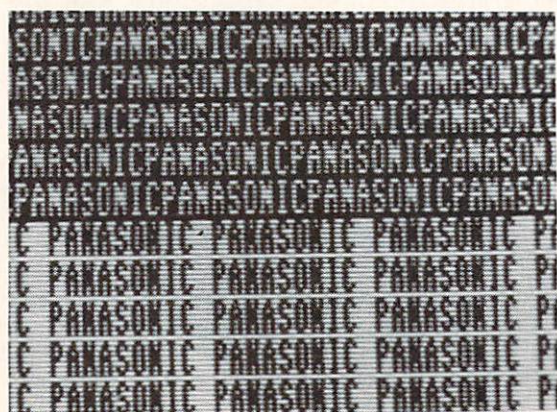
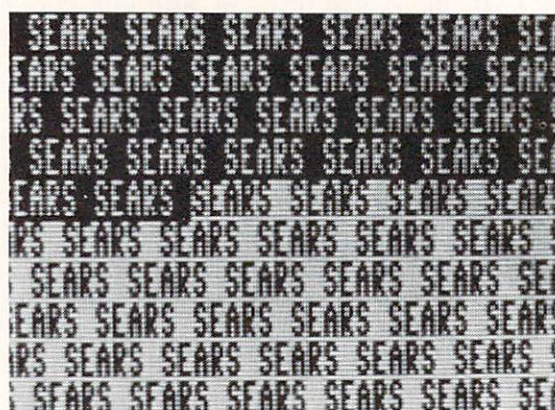
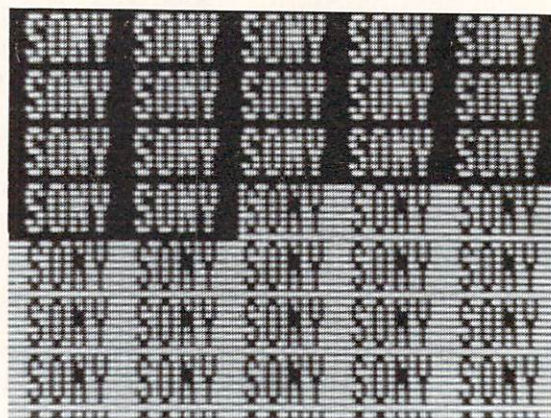
In general, we've found that only a couple of specifications have any real bearing on the quality of a video monitor. (1) Aspect ratio. This determines how rectangular the picture is.

Some screens are wider horizontally than others. (2) Shadow Mask. A good black matrix shadow mask is the key factor in good brightness and contrast. Look at the screen with the monitor turned off. If it's not black with the power off, the picture won't be very good when it's turned on. (3) Controls. No matter what the image looks like, everybody wants to diddle with it. The more controls you have, and the wider the range of control they offer, the more likely you are going to be able to adjust the picture to suit you. Of course, if the default settings look really bad, no amount of adjustment will be enough. (4) Extra Features. Some of these monitors incorporate several modes of operation. A couple include TV tuners. Some have extra video and audio in and out connectors. If these things are important to you, by all means take them into account when you go shopping. If not, don't be overcome by the flash, and get what you need.

What follows is a comparison of nine color monitors for the C64, C128, and Amiga, including Commodore's own and even the Atari ST RGB monitor hooked up to the Amiga! The accompanying chart compares the features of these monitors, and will help you to decide which one is best suited to your machine. Also, check out the sidebar for help in obtaining the special cables you'll need to hook some of them up.



DIGITAL RGB DISPLAYS



MONITOR ROUNDUP

continued...

SONY KV-1311

The Sony KV-1311 seems to be enjoying the spotlight as the premier Amiga monitor of choice among informed Amiga owners. We've had it recommended to us by a wide variety of people. It incorporates not only composite, RGB digital, and RGB analog circuits, but includes a built-in TV tuner as well.

The Sony's connectors are, strangely enough, located on the right side of the case rather than the rear. (We guess it's to improve the rear clearance and looks.) Besides RCA composite in and custom RGB digital and analog in plugs, the Sony comes with TV coax in and video and audio output jacks. The RGB mode switch is also on the side panel.

Side controls include hue, color, brightness, horizontal centering, and vertical hold. The front panel has selector switches for TV, composite, and RGB inputs, and controls which step the TV channels, volume, and picture (brightness/contrast), up and down.

The Sony KV-1311's Trinitron display is probably the best in all modes of the monitors we tested. Of course, one could argue that for the price, it should be. The picture is bright, the colors are sharp, and both text and graphics look right on. If you are interested in a top-of-the-line, do-everything display, the Sony KV-1311 is probably your best choice.

MAGNAVOX CM-8515

This Magnavox monitor came to us with the audio circuit and the power indicator LED dead, but at least all three display modes worked.

Rear connectors provide RCA composite and audio inputs, and Magnavox-specific digital RGB and analog RGB inputs. Switching is accomplished via a front-panel pushbutton.

Vertical height, horizontal width, and both horizontal and vertical centering are controlled at the back of the monitor. Front panel controls include hue, brightness, contrast, color, sharpness, and volume.

All three display modes of the Magnavox CNM-8515 look good. Colors are sharp, and text displays are crisp. The composite input is not separated video, but it looks good anyway.

Provided you don't run into the same quality control problems we did, this would make a good upward-transition monitor for C64, C128, and Amiga use.

PANASONIC DT-M140

This Panasonic display is versatile, sharp, and bright. Because it supports composite, RGB digital, and RGB analog inputs, it can be used with all three Commodore computers.

The Panasonic has an incredible array of connectors and input options. With full banks of BNC, RCA, and multi-pin connectors, it's hard to imagine a piece of equipment you could not hook up to this monitor somehow. For our purposes, it has RCA composite and audio inputs, RCA RGB analog inputs for the Amiga, and a unique multi-pin RGB digital input plug for C128 80-column input that requires a special cable. Unfortunately, the NTSC input is composite and not separated chroma/luma.

Rear controls include vertical hold, horizontal size, vertical size, sharpness, and tint. Front panel controls provide contrast, brightness, volume, and horizontal centering adjustment, plus pushbutton selection of RGB analog, RGB digital, and composite input.

In our tests, the digital RGB and composite pictures looked OK, but the analog RGB demonstrated some color artifacting, i.e. shadows of a different color surrounding the displayed color.

AMIGA A1080

Commodore /Amiga's own A1080 RGB analog monitor is probably not the best monitor for the Amiga, but it's not bad. It does not have the sharpness of some of the other monitors here, and the 80-column text display is somewhat fuzzy.

The A1080 has two video connectors, a standard IBM 9-pin D connector for RGB digital/analog input, controlled by a switch on the back of the monitor, and optionally separated/composite RCA jack inputs selected by a switch on the front control panel. There is a single audio input jack, a strange implementation for a monitor that is supposed to be companion to a computer with stereo

MONITOR ROUNDUP

continued...

audio output jacks.

There are no rear controls. Everything is conveniently located under the front control panel cover. Controls include horizontal position, vertical hold, color balance, tint, brightness, contrast, and volume, as well as the composite/separated/RGB switch.

Commodore is currently offering a package price on the Amiga with RGB monitor for \$1295, which is equivalent to giving the monitor away, not a bad deal any way you slice it!

ATARI SC1224

This little RGB analog-only monitor with the single strange Atari-specific input jack produces one of the sharpest pictures of any of the monitors we tested. It is the only reason the Atari's video output looks better than the Amiga's in a side-by-side comparison. Text is sharp, the colors are bright, and it just plain looks good. If you want to hook one to an Amiga, you will need a special cable (see sidebar).

The only input to this monitor is RGB analog via the special Atari 13-pin DIN connector. Rear panel controls include brightness, vertical hold, vertical height, vertical position, horizontal position, and horizontal hold. Front controls include only volume and contrast.

The major problem with using the ST monitor on the Amiga is its aspect ratio. The display is much wider than it is tall, resulting in pictures that are distorted to the horizontal. There is also an overscan problem that produces images that spread to the very edges of the screen. Though the picture is very sharp, these problems would keep us from recommending the ST monitor for use with the Amiga.

AMDEK COLOR 500

This Amdek monitor provides composite and digital RGB inputs for use with the C64 or C128. After a couple of weeks the RGB circuit went out on our test unit, one of two failures we experienced during testing (see Magnavox).

The Amdek's rear inputs are standard RCA

composite and IBM 9-pin D RGB digital connectors. There are two sets of composite inputs and audio jacks, so you could use this monitor with both a C64 and C128 without having to switch cables all the time, though it does not offer separated video. The composite switch is on the front panel, but unfortunately the RGB switch is located in the middle of the back panel, and is almost impossible to get to easily.

Rear controls include color, tint, horizontal phase, vertical hold, and vertical size. On the front panel are controls for volume, brightness, and contrast, as well as a pushbutton switch for selecting which composite input you want to display, plus one to kick in a "green screen" text mode.

This monitor produces an average display, with some fuzziness of characters and some bleeding of colors. And, like we said, the RGB circuit gave out on our demo unit after only a couple of weeks.

SEARS RGB/TV

If you need C64/C128 compatibility plus a TV set all in one unit, the Sears RGB/TV is a good deal. The new Sears catalog shows a model with a little different cabinet style than the year-old model we've got here, but the guts and controls seem to be the same.

The RGB connector is a Sears exclusive, but they sell a cable to fit it. The composite, audio, and separate RGB audio jacks are all standard RCA issue, as are the video and audio outs. There is also a TV coax jack. All are located on the back of the set.

In a side panel are controls for color, horizontal centering, tint, brightness, RGB brightness, contrast, and vertical hold. The front panel gives you a "green screen" text button, RGB/composite/TV selector, a vertical screen compression switch (for clearer text), volume control, and TV channel selector buttons.

For \$340, it would be pretty hard to beat this monitor for all-around versatility, and the video is good, too.

TEKNIKA MJ-22

Teknika's MJ-22 is a dual-mode RGB/NTSC

MONITOR ROUNDUP

continued...

monitor for C64 and C128 owners that offers excellent display quality.

The rear connectors include a DIN plug for digital RGB plus RCA separated video and audio jacks, as well as composite video and audio outputs.

The vertical linearity, vertical size, and horizontal hold controls are located on the back of the unit. Horizontal position, vertical hold, contrast, brightness, color, tint, and volume controls are located on the user side, along with an RGB/composite selection switch.

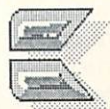
The Teknika's video is clear and sharp, and the separated video input makes the 40-column mode especially so. This is an excellent monitor for C64/C128 use.

COMMODORE 1702

Commodore's 1702 is still a pretty good bargain. Its separated composite input produces a good, clear picture, and even the front-panel single composite input does not do badly. The switch to select which input is displayed is on the back of the 1702, unfortunately.

All the other controls on this unit are up front. They include tint, color, brightness, contrast, horizontal position, vertical position, and volume controls.

This monitor is a bargain for the C64 owner, and with the proper cable (see last issue) it can be used for respectable 80-column monochrome output with a C128. It even produces an acceptable 60-column display when used in conjunction with the Amiga's composite output, with marginal color metamorphosis. It's a good entry-level monitor.



WHERE TO GET CUSTOM CABLES

The Amiga has some strange connectors, so where do you get cables to hook up printers, monitors, and such? Well, two companies helped us out by making custom cables for some of the monitor hookups for this article.

Redmond Cable, 17371 - A1 NE 67th Ct., Redmond WA 98052, (206) 882-2009, has many custom Amiga cables in stock, and can custom make just about anything you've got the pinouts for. They made up several weird cables for us, and even produced our Amiga-to-520ST monitor cable. We also found Cables To Go, 4215 N. Main, Suite 201, Dayton OH 45405, (513) 275-0886, to be a good source of custom cables. They supplied us with the Sony KV-1311 and other monitor cables, as well as printer cables. Both have many varieties of Amiga cables in stock at reasonable prices, will make custom cables fast at a good price, and will sell to individuals or in dealer quantities.

MAKE	MODEL	PRICE ²	C64 Comp	C128 RGBI	Amiga RGBA	INFO Rated
Sony	KV-1311	\$500 ⁰⁰	+++++	+++++	++++	+++++
Amiga	A1080	\$400 ⁰⁰	++++	+++++	++++	++++
Magnavox	CM-8515	\$450 ⁰⁰	++++	++++	++++	++++
Panasonic	DT-M140	\$330 ⁰⁰	++++	++++	++++	+++++
Atari	SC1224	\$400 ⁰⁰	n/a	n/a	++++	++++ ¹
Teknika	MJ-22	\$255 ⁰⁰	+++++	++++	n/a	+++++
Sears	RGB/TV	\$340 ⁰⁰	++++	+++++	n/a	++++
Amdek	Color500	\$370 ⁰⁰	+++	++++	n/a	++++
Commodore	1702	\$200 ⁰⁰	++++	n/a	n/a	++++

¹Not recommended for Amiga (see text).

²Discount prices listed.



Reader Mail

Dear INFO,

I just read my first copy (Dec.-Jan.) of your magazine with the kind of enthusiasm I didn't know was possible over a single issue of ANY magazine! I've been a regular reader of Run, Compute!, Compute's Gazette, Ahoy, Microcomputers, and Power Play for a couple of years and am convinced that your magazine is by far the most informative of the lot! Please put me down for a 2 year subscription - and keep up the good work!

Jerry E. McSpadden
N. Little Rock AK

Jerry, you sure know how to get a letter published! -Mark & Benn

Dear INFO,

Your Dec.-Jan. issue of INFO was quite an informative one for the Amiga owners. I am sure many Amiga owners, myself included, will simply shrug off your remark in the News & Views column that the Amiga is "just a game machine anyway." But these words surely will dishearten many who took the step into the brave new world of the Amiga. I am aware that you must remain totally unbiased in your reviews and viewpoints--after all, you did expose the Plus/4 as the total turkey that it was--but to include personal feelings in a strictly fact oriented column somehow lowers your standards to the readers. If you want to expose a REAL games machine--and total turkey to boot--then talk about the Atari ST along with Jack & Co.

Mark Valera
Rego Park NY

Mark, we thought we did expose the ST! Seriously, that comment about the Amiga being "just a games machine..." was meant to be pure sarcasm--after all, we had just listed a couple of dozen pieces of productivity software for the Amiga--but I guess that it just wizzed past some readers' heads. The Amiga has no greater fans than the INFO staff. -Mark & Benn

Dear INFO,

For a magazine that flaunts its reputation as "hardhitting, straightforward, etc.", in my opinion you have a poor track record as far as handling subscriptions, mine in particular. This makes the third letter I've written concerning missed issues. I don't mind them being late (usually the newsstand and bookstores get theirs before me) but since subscribing I've been dissatisfied and probably won't renew. As for answering letters, it seems you only print and publish ones that "rave" accolades about your mag and the Hell with the rest of us. I may be only I subscriber but sooner or later the numbers add up and we'll be reading INFO's obituaries in other magazines.

R. E. Williams
Girdwood AK

Well, we're sorry it didn't work out for you. We send INFO out by third class mail, which is not forwarded and sometimes takes forever, so if you move, your issues are just pitched by the US Postal Service, and when they are delivered they sometimes come after the stores already have their copies. We are trying to get set up with second class for the next issue, if we can get through the red tape required, and that should help out with your subscription (and all the others, too). In the meantime, make sure you let us know immediately when you change addresses, so we can make sure your issues get to you.

-Mark & Benn





Reader Mail

Dear INFO,

Please enter my subscription for one year at \$18.00 for six issues, "A saving of \$3.60", the cost of one (1) issue of the highest-priced computer magazine on the market. Oh boy, big deal. Most subscriptions offer a 50% or better savings. Are you greedy, do you have a lousy distribution network, are your costs that high, or what? I'll support you for awhile, because I like the magazine. The reviews and articles are intelligent, informative, and well-written, but listen: After a year, I'll need a better incentive to renew my subscription. I want a better rate and type-in programs.

David Larose
Bush LA

David, we cost more because the articles are intelligent, informative, and well-written. Actually, we are set up very differently than most magazines. Most rely on subscriptions and newsstand sales only to pay part of the production costs, and make their profit on the ad revenues that their artificially high circulations generate. At INFO, it works exactly the opposite. We try to line up enough advertising to defray the cost of printing, and count on issue sales for the profits. This is so that we can be free of advertiser influence when we evaluate products. -Mark & Benn

Dear INFO,
You look marvelous!
Don J. Pace
St. Louis MO

Ain't it the truth? -Mark & Benn

READER SURVEY COMMENTS

Marty is diligently typing away, entering the data from our reader surveys in #8 into C128 Superbase, and when he's done we'll let you all in on the results. In the meantime, here are some comments taken from the surveys:

"Your magazine is a gem! Your editorial comments are so biting, so honest, that I find myself cringing at times. Save plenty of pages for the Amiga."

- EB, graphic artist, New York

"INFO is my Bible of Commodore computing. Thanks! Keep up the great sense of humor."

- DS, clerk, Massachusetts

"Dongles' are OK. They allow disk copying while protecting the proprietary interests."

- JB, security specialist, Maryland

"The Commodore 64 system of dealers stinks. Too many outlets (most of them) know little and care less about the product. Clerks seem to be chosen by drawing straws--short straw goes to computers!"

- FM, retired, California

"More naked women!"

- RW, luthier, Illinois

"Commodore marketing is screwed up. If my company made as many gaffes there'd be wholesale beheading."

- CS, manager, Kentucky

"Software companies are overstepping their bounds when they ask \$450-\$750 to place a program like 'Bank Street Writer' on hard disk. They are saying 'I am greedy--rip me off!'"

- WS, teacher, Michigan

"For me to buy the Amiga, it must be reasonably IBM compatible--otherwise it will have no place in a business with IBMs."

- AB, attorney, North Carolina

"Don't let Amiga coverage overshadow the 64/128 until a complete Amiga system can be bought for under \$1000. Also, please throw away all of your Plus/4s. You're not doing anybody any favors by giving them away."

- AB, software engineer, Colorado

"I like the fact that INFO is not filled up with those worthless type-in programs which take up space in most magazines."

- IS, programmer, Texas



ATARI ST UPDATE



It's really hard to keep up with Jack Tramiel. He likes the game to be active, so he's always pulling something. Sometimes it's a new trick, and sometimes he repeats an old one. Here are some of the shuffles he's worked the past couple of months:

(1) At COMDEX, the important dealer product show, Atari's booth was sublet at \$1000 a crack to independent software developers so they could parade their wares. In one shot Tramiel (A) paid the rent on the booth and made a profit besides, (B) saved Atari the immense expense of having to fill the booth with their own display, and (C) showed the buyers over fifty software titles for the Atari ST, effectively dispelling the no software stigma that is still wrongly attached to Commodore's Amiga. By the way, Commodore had done the same thing at the June 1985 Consumer Electronics Show, and will apparently have another vendor-populated display (taking up 100 booths!) at COMDEX in Atlanta this month.

(2) While negotiating a deal to license Unix V from AT&T to run on the ST, Tramiel managed to sell a third party developer a beefed-up version of the ST, to be retailed as a Unix workstation. By linking Atari's name with stable, staid AT&T, Tramiel has reassured many who were saying that Atari was not established solidly enough to assure continued support of the ST.

(3) Atari has announced that the 520 ST will be going into mass market discount stores (like K-Mart) at a reduced price. It will be sold as individual components, with the ST listing for about \$300, the drive for \$200, and color monitor for \$400. Simple math tells us that this gives you about \$100 savings over the current system price, though the discounters will probably reduce it even more. The mass-market ST will be equipped with an RF modulator so you can hook it up to a TV set, and a composite video jack so you can use it with an inexpensive color monitor--this time you won't have to buy Atari's RGB monitor unless you want RGB output. To try and keep their dealers happy, they are introducing a new

one-megabyte ST to be sold by their computer dealers only. It will be an all-in-one unit like the Amiga, including the power supply in the main cabinet. The main cosmetic difference is that the 1040 ST's keyboard will not be detachable. The 360K single-sided drive will even be replaced with an 800K double-sided unit. The monochrome 1040 ST will sell for about the same price as the current color 512K model, \$999. Needless to say, many dealers who remember Tramiel's mass-market shuffle with the Commodore 64, which cost Commodore most of its dealers at the time, are saying "I told you so!" to those who signed on with Atari for the 520ST.

(4) Atari has bundled several respectable software packages with the ST, including the NeoChrome paint program, a version of the AtariWriter wordprocessor, a database manager, LOGO, and BASIC. (The Amiga is being shipped with a Tutor program, BASIC, and the Electronic Arts Kaleidoscope program.)

Atari seems to want people to actually be able to use their computer as soon as they take it out of the box! What a radical concept!

(5) Even some of the software developers like Electronic Arts, who were skeptical of the ST's chances at first, are now jumping on the bandwagon with some software offerings for it. It is just plain selling too well for them to ignore.

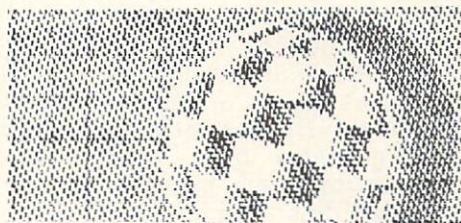
It remains to be seen whether all the slick maneuvering will help or hurt Atari in the long run. It worked for Tramiel with the Commodore 64, but made a lot of dealers mad, and left most people with the impression that the C64 was just a mass-market game machine. The same things could happen to the ST. Or dealers could decide they've had it with Uncle Jack going behind their backs to the mass merchants and drop Atari en masse. Most discounters have even said they don't want the Atari in their stores. It looks like the future of Atari is still up in the air.

ST VS. AMIGA

Well, our comparison of the Atari ST and the Amiga last issue generated enough hate mail from ST fans to keep the INFO furnaces hot all winter. Most were real doctoral dissertations, repeating Atari's company line

verbatim, extolling the virtues of the ST feature by feature just like a sales brochure....I'm sick of hearing about the ST's built-in MIDI interface. It is a bare-bones interface, anyway. If you are among the people who want it, MIDI can be added to the Amiga for fifty bucks. (See Peggy Herrington's great article on Amiga sound in this issue.) In the meantime, the rest of us can make beautiful music with our off-the-shelf Amigas while the rest of the ST owners are beeping along....And the hard disk interface? The Amiga does the same DMA accessing that the ST interface provides, and it's as fast as Atari claims for theirs....And yes, 640X400 interlace mode on the Amiga DOES flicker if you've got a wide range of colors on-screen, but we've seen a lot of stuff that looks pretty good, too, and at least it's not monochrome. Interlace is probably the worst mistake Commodore made on the Amiga. The Rumor Mill says the next Amiga will have the rock-solid 640X400 graphics they should have put in in the first place. (We know the Amiga isn't perfect.)...And yes, the ST does at this writing have more software available. It has also been available for six months longer! It takes time for software to catch up with a machine. It did for the ST, and it will for the Amiga. First quarter '86 is when the floodgates are opening. Commodore says third parties will release 82 titles in March alone, and the latest title total is over 130. At least it's not taking two years like it did for the Mac....And we know that Intuition had crash problems in version 1.0. We said so. 1.1 is much better, though still not 100% perfect. The point is, it is not carved in stone, and regular updates (which Commodore is providing; version 1.2 should be at your dealers by the time you read this) are taking care of the bugs. Atari has decided the ST is now perfect, and are putting the OS in ROM. Bye-bye bug fixes! Also, remember the IBM-PC in its first release? Bugs on top of bugs! Memories sure are short....We keep hearing from Atari fans that software developers think the Amiga is hard to program, that it's memory hungry, disk inefficient, runs at a slower clock speed, the ST has a faster DMA buss, etc., etc. All of this is PR hype. Ask a real software developer. Ask a real hardware engineer. You can write bad

applications and good applications on both machines, but a well-written program on the Amiga will run rings around a well-written program on the ST, and will wave the flag and play the national anthem as it does!...And as to the suggestions that we don't know what we are talking about--thanks to one of our loyal and faithful dealers, we have had an Atari 520 ST in the office, working with it every day for three months now. (We just sent it back--we didn't want to keep it.) We compared everything it did side-by-side with the Amiga over that time and not once did the Atari impress us as doing something better than the Amiga! Sure, this is a Commodore magazine. Sure, we want to see the Amiga do well. The fact is that we believe the Amiga is ten times the machine the ST is. And yes, we did look at the price tag. At the same time, we know that the ST is in many ways a much more capable machine than many of the computers that came before it, and we think that many ST owners will be very happy with it, at least as long as Atari survives to support it. But we still don't think that it's the best choice, even at that low price.



BOING! VS. BOINK!

By now, most of you have seen the bouncing ball demo on the Amiga, called BOING! You may also be aware that Atari produced a program called BOINK! for the 520ST that was identical, the point being, of course, that the ST could do anything the Amiga could do. An interesting exchange on the BIX network, reported in the March issue of BYTE, indicates the real difference between these two machines. BOING! on the Amiga uses up a fraction of the machine's power. (In fact, the program had to be slowed down considerably just to meet the requirements of human perception.) You can prove this by simply pulling down the BOING! screen and running other programs at the same time. BOINK!, on the other hand, represents a major programming effort by the Atari staff, and uses the ST to full capacity. While applauding BOINK! as a fine effort, the BIX conversants had to hand the Amiga the prize for true power.

NEW AMIGAS?, NEW PRICES?

Though Commodore denies it, The Rumor Mill says a \$500 price cut is coming soon for the Amiga. In the meantime, until the end of May Commodore is offering a \$500 savings on an Amiga/monitor system, which is a pretty good deal if you were planning on getting a new monitor anyway. (See Commodore's ad inside the back cover.)

There is also talk that work is progressing on at least two more Amiga models. Some dealers are saying that one will be an improved Amiga with more memory (at least 512K) and better graphics (640X400 without interlacing), plus other improvements.

Infoworld says a new model called the Ranger is due out in June or July. It's supposedly a full-blown "Amiga/AT", with a megabyte of RAM, a 68020 cpu chip for true 32-bit operation at speeds of 12 MHz or better, open architecture with a slotted motherboard, an improved graphics chip with 1024X780 maximum resolution, and possibly a built-in 20/40 MByte hard disk. Pricing is said to be in the \$3500-\$4500 range. Though we have confirmed that the Ranger exists, our most reliable sources at Commodore say that there will be no new Amiga models until 1987...

RUMOR MILL

What megabuck-profit-making famous spreadsheet publisher supposedly has their spreadsheet program done for the Amiga but wants a three million dollar primer payment from Commodore before they'll bring it to market?

Furthermore, what famous PC dataBase publisher has their program ready for the Amiga but wants a half a mil and 35% royalties on PC-style high retail prices to bring out their product?

If this kind of greed and moneygrubbing offends your sensibilities, we suggest a well-placed phone call or two to get it off your chest.

DEGAS FOR AMIGA

Batteries Included has announced that they will be porting their excellent graphics program Degas to the Amiga. It is slated for release

sometime this summer. It will apparently be considerably enhanced from the Atari ST version.

C= IBM/PC CLONES COMING!

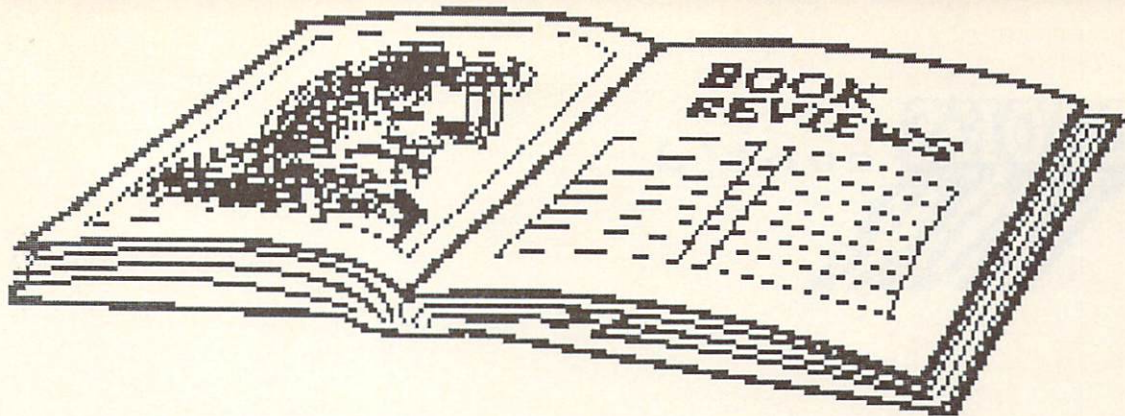
Commodore will be bringing their European PC clones (first mentioned in INFO in our CES Report in issue #7) to the American market later this year. We believe this move will help build Commodore's image here; their PC-10 is one of the hottest-selling PCs on the Continent.

The final drive/ram configurations to be sold stateside are not finalized yet, but the units apparently will include an enhanced graphics card capability and will run Lotus 1-2-3, dBaseIII, Flight Simulator II, and most other PC programs without a hitch. Commodore is targeting a price tag less than the best-selling Leading Edge PC! Think about it: with the C64, C128, Amiga, PC-10, PC-20, and C900 Unix system, you could open a Commodore-only computer store that could compete very effectively in both the home and the business markets. Now how about bringing out your LCD Laptop, Commodore?

C128 FAMILY?

We caught some flak for predicting the demise of the 8-bit Commodore computers last issue. We didn't mean to expedite their end by implying that the C128 and C64 should roll over and die tomorrow. We still do 80% of our work here on them! They are good machines, and should have a good market for three or four more years. In fact, even though we think the move away from 8-bit machines is inevitable, the Rumor Mill has it that Commodore may have caught some "Apple II Forever!" fever. "PET Forever!" seems to be the cry at Commodore R&D. We are hearing about prototypes of a new C64 upgrade (the C256?). At least some versions are equipped with 256K of RAM, a faster 6500-family chip, no CP/M, and a built-in 3.5 disk drive. Sounds like an updated version of their unreleased D model 128 shown at the 1985 CES (see issue #7). Some say the new model is due out later this year, others peg it for 1987. We have to wonder if there isn't some office politics at play here, with the technical staff at West

continued on pg. 79



MACHINE LANGUAGE FOR THE C64

Jim Butterfield is the High Priest of Commodore computing. As I found out at Lincoln College last summer, he is also an excellent teacher. Now he's taken his experience with Commodore computers and assembly language and put it into book form. The result is *Machine Language for the Commodore 64 and Other Commodore Computers*. A windy title, but accurate.

Jim brings you into machine language step by step, but at a pretty swift pace. For example, he covers binary and hexadecimal in just a couple of pages. CPU and computer system operations are also covered quickly in the first chapter. Some readers might want to go to other sources later for a more in-depth look at hexadecimal math and microprocessor concepts, since this material is more introductory than comprehensive. Jim's approach is pragmatic: he only gives you what you need to know to move on to the next concept.

From there, he goes into a variety of machine language topics, many of them specific to Commodore computers. You'll learn how to link BASIC and m/1, how to use wedges and interrupts, how to call ROM routines, and how floating point numbers are stored, among other things. The main thrust and advantage of this book is its Commodore-specific focus. Each section ends up with a nice review of the chapter and some questions and/or programming projects to try.

The entire last half of the book is dedicated to memory maps of Commodore computers, from the 2001 PET to the Plus/4. Even the B128 is included. Unfortunately, the book was published before C128 memory maps were available. These maps are not exhaustive, but Jim includes many excellent tips on where to find usable zero page locations, etc. Other appendices show the Commodore character sets, special chip registers, and even include a type-in listing for his SuperMon machine code monitor, just in case you don't have access to it already.

Like I said, Butterfield is a good teacher and a good writer. *Machine Language* is clear, concise, and well-written. However, it does

concentrate on Commodore applications, and doesn't go into exhaustive detail on the 6502 instruction set, so you will probably want to use it in tandem with a book that deals specifically with the 6502. A good addition to your programming library.

Machine Language is from Brady Communications.

DIGITAL DELI

This book is a collage, a melange of pieces from over a hundred writers and artists, collected into an inch-thick 8 1/2 X 11 volume.

It is best attacked as you would attack an antipasto, the most tasty tidbits first, and the less attractive ones only when those are gone. *Digital Deli* was written by a group of New York writers who call themselves The Lunch Group because they try to meet for lunch once a month. Steve Ditlea edited the contributions.

This Group runs the gamut from computer insiders like Stan Veit to big names like William F. Buckley, Jr. There are also pieces by guests like Steve Wozniak, writing on the Homebrew Computer Club and his escapades with Steve Jobs and Cap'n Crunch.

Among the things you'll find in *Digital Deli* are (1) a cartoon map of the USA, optimized to detail computer-related locations, (2) a timeline of personal computer development from Blaise Pascal to Lotus Symphony, (3) a two-page cartoon explanation of how a digital watch works, (4) the 10111th Psalm for computerists, and (5) an article on how to work a computer show in 30 minutes by The Flash.

There's a whole section of articles from the users of different computers, from the VIC-20 to the Epson QX-10. These aren't computer reviews, but stories of the real-life experiences of people with their computers, replete with successes and frustrations. There are articles of historical significance here, too, including a piece by Les Solomon on the creation of the Altair, and one by Wallace Feurzeig on the origins of LOGO. One even chronicles the lives and times of Charles Babbage and Lady Ada Lovelace.

There are articles on the impact of computers on society, too. One tells how an automatic teller works. Another (by Ted Nelson) investigates computophobia. There's

BOOKS cont'd

even an article comparing the ways that kids and adults perceive computers.

This is a great book to just keep around and read an article or two in when you've got nothing better to do. Most of the articles are interesting, clever, short, and impart some information or insight that will give you something to think about. Some features, like "The Forty Year Old Hippie Buys a Computer" comic strip, will give you a good guffaw. If you are into computers and computing, you will love this book.

Digital Deli, \$12.95 in paperback, from Workman Publishing.

STARTING FORTH

Forth is a language that is not for everybody, but it does have a lot of nice things going for it. It is an interpreted language, like BASIC, so you can sit down at a terminal and program interactively. What you see is what you get, without having to load editors and compilers and assemblers and debuggers for hours on end to get results. It is also, unlike other interpreted languages, very fast and compact. Forth applications of moderate size take up less memory than pure machine code for the same task. It is slower than machine language, but speed-intensive portions of Forth programs can be rewritten in assembly language to make them run faster.

Of course, Forth is also hard to learn. With its reverse-Polish notation, cryptic symbolic code, and closeness to the internal workings of the cpu and its stack, Forth scares many people away. It is for this reason that Leo Brodie of FORTH Inc. wrote the introductory book *Starting FORTH*.

I hope that someday everything will have an introductory book as good as this one. It is friendly and well-written, illustrated with cartoons and programming examples that make clear even the most potentially obscure points of this complex language. It is so good that it is mentioned invariably by Forth insiders as required reading.

Brodie starts with the elementary characteristics of the Forth language: words, the dictionary, and the stack. By the second page, he has you writing a line of code to print a bunch of asterisks on your terminal just by

typing in the word "stars". From there you progress to an understanding of Forth's integer math functions, its screen-oriented editor, and its file-handling capabilities. The book works best if you boot up Forth on your Commodore 64 and try the examples as you go. (Several are listed in the Product Roundup in INFO issue #8.)

This book abounds in programming examples and clever explanations of How Things Work. It is a thoroughly enjoyable introduction to programming in a powerful but obscure language.

I'm not guaranteeing that you'll love Forth. Like I said, it's not for everybody. But if you are interested in it, *Starting FORTH* will, indeed, get you started in Forth, and will do so relatively painlessly.

Starting FORTH by Leo Brodie is from Prentice-Hall.

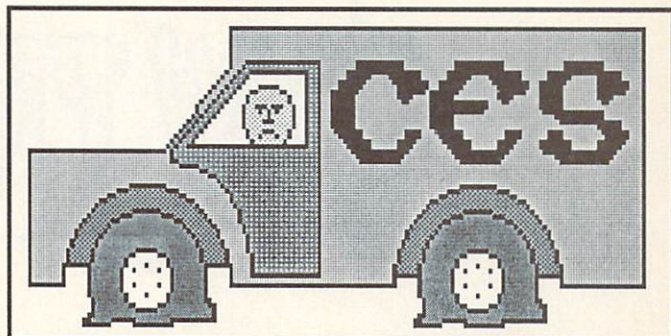
HACKERS

Before there was a computer in every home, school, and office, there were hackers. In *HACKERS*, Steven Levy relates the escapades of the personalities who liberated the computer from the ivory towers of business and academia and delivered it in micro form to the masses.

Levy has divided his book into three major sections. Each chronicles a different era of hackerdom. In the first, he concentrates on the MIT hackers who first worked with the TX-0 and DEC PDP-1 minicomputers at MIT's Artificial Intelligence Lab. There they developed LISP, the language of artificial intelligence, and Spacewar, the very first interactive video computer game. Bill Gosper spent thousands of hours hacking LIFE displays on the PDP-1, discovering the first glider gun, among other things. The MIT hackers were the among the first true computer junkies. They lived, for all practical purposes, in the university's computer center, hacking all day and all night at the computer terminals. From MIT they went on to form some of the most innovative and influential minicomputer software houses.

Part two examines the hardware hackers of Silicon Valley in the mid-seventies, including Lee Felsenstein, inventor of the Sol terminal

BOOKS cont'd



computer and the Osborne portable, Bill Gates, founder of MicroSoft, and the Woz, Steve Wozniak, who developed the Apple computer. All were involved somehow with the infamous Homebrew Computer Club, which at best estimate spawned over fifty Silicon Valley firms.

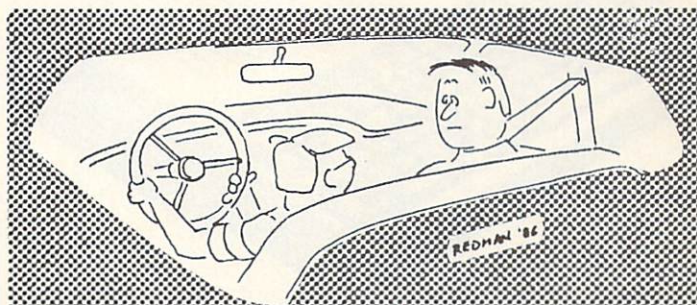
The third section of **HACKERS** deals with the high-paid software game hackers who followed the introduction of home computers. Levy zooms in on Sierra On-Line, following it from a husband-and-wife kitchen operation to its Sodom-and-Gomorra days of plenty in the High Sierras.

Throughout this volume runs the thread of the Hacker Ethic. Steve Levy has done an excellent job of putting the Hacker Ethic into the pages of a book. And best of all, he has not done it by trying to turn it into a heavy philosophy, shoving platitudes and deep psychological insights down our throats. Mostly what he has done is just to relate what hackers do, what drives them, and what means something to them. Why would somebody stay up all night, night after night, just to produce some weird pattern on a CRT screen? If you already know the answer, then in this book you will find the assurance that you are not alone. If you don't know, you will gain the perspective you need to understand the joy that comes from pure intellectual achievement for its own sake. Levy's book is a must-read, both for computer hackers and for those who must live with them.

HACKERS is \$4.50 in paperback, from Dell Books



For computer people, it looks like CES is dying. The floor space devoted to computers at the Winter Consumer Electronics Show in Las Vegas was the smallest it's been since personal computers began showing there. Even the porn video section was larger. There are a couple of good reasons for the dropoff. Many companies died in the Great Shakeout, and many others were left so financially strained that they can no longer afford the expense of showing at CES. And, to be fair, many former exhibitors are no longer convinced that showing their wares at a consumer retail show like CES is a financially sound investment. Some have moved to the more business-oriented shows like COMDEX, and some have concentrated on direct promotion. But it all boils down to the same thing: CES is no longer The Place To Go to keep up on personal computing. We'll continue to cover Summer CES in Chicago because it's close to home, but unless things change drastically, this is probably the last Las Vegas Winter CES show for INFO. In the future, we'll be covering more Commodore-specific regional events, along with COMDEX, where Commodore is planning a huge 100-booth display the end of this month.



"Driving's okay Dad, but without the split screen and scoreboard it just isn't realistic."



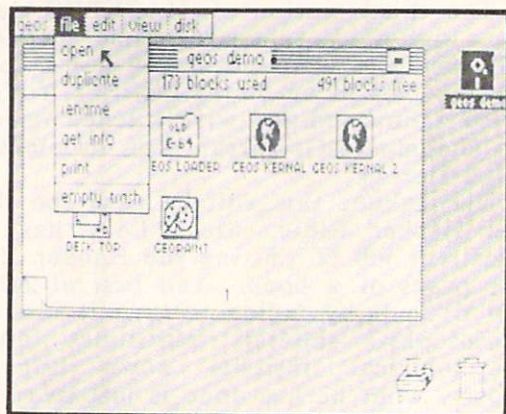
NEW PRODUCTS

APPLE CLONE

If you need Apple compatibility but don't have the bucks for a][c or][e, then the new **Laser 128** Apple][clone might be just what you're waiting for. It's a smart-looking legal Apple-compatible for only \$395. It looks mostly like a][c with a numeric keypad. It has a built-in 5.25 drive, and all the serial, parallel, mouse, drive, sound, modem, etc., ports the][c has and then some. It also has a single][e-compatible expansion slot, which is something the][c doesn't have. The level of compatibility is said to be high, with updates promised as the ROMs are improved. Perhaps best of all, one of the unit's two North American dealers is Central Point Software, long noted for their excellent products and customer support. Central Point Software, 9700 SW Capitol Highway, Suite 100, Portland OR 97219, (503) 244-5782.



NEW FOR THE C64



GEOS

A very interesting product from a new company is **GEOS** from Berkeley Softworks. **GEOS** is a window-and-icon operating environment for the Commodore 64 which comes with mouse-driven **geoPaint** and **geoWrite** drawing and wordprocessing programs. The **GEOS** shown at CES (and shipping for the last few weeks) is a black-and-white MacIntosh-type product, but they are now polishing a full color version. For \$59.95 all-inclusive, you can bet we'll be taking a close look as soon as we can get our hands on this one.

SPEEDSCRIPT ENHANCEMENT

If you are a **Speedscript** user, **SPEEDPAK/** will add several useful functions to your wordprocessor, including user-defined macro phrases, file encryption, simultaneous editing of two documents, help screens, and alternate fonts, as well as mail-merge capability. \$15.00 ppd from: Upstart Publishing, Dept. IM, PO Box 22022, Greensboro NC 27420.

NEW PRODUCTS

LIPS LISP

When Visionary Software introduced COBOL for the C64, I thought we'd seen the upper limits of the languages that could be brought down to this small but mighty machine. Then Abacus delivered a subset of Ada. Now, List Processing Software brings us **LIPS** for the Commodore 64, for only \$39.95. Like the Abacus Ada, **LIPS LISP** is not meant for serious software development, but rather to provide familiarity with the language. In fact, this Lisp is written in BASIC, and the source is included so you can examine it. Of course, this also makes it slow, though the compiled BASIC is not as slow as I was afraid it might be. I've got to admit I am impressed with this implementation. Despite its limited speed, **LIPS LISP** and its associated excellent tutorial manual provide a painless introduction to the premier AI language. \$39.95 ppd from: List Processing Software, PO Box 3422, Rapid City SD 57702.

POWER CARTRIDGE

The **Power Cartridge** is a handy little all-in-one utility package in a 16K ROM cart for the C64. Among the easily-used, menu-driven capabilities it gives you in one box are: (1) A reset switch with warm, cold, program, and unnew BASIC reset options, (2) A machine code monitor, (3) BASIC utilities like AUTO numbering, DELETE, DUMP, FIND, MERGE, et.al., (4) Disk and tape turbo speedups of 5 and 10 times faster, (5) Multiple-option screendumps to Commodore or Epson printers from within almost any running program. (We used this option for some of the screen dumps in this issue.), and (6) A memory-resident program copier which seems as capable as any we've tested. We'll take a closer look when we compare cartridge-based memory copiers in a later issue, but after just a few days using the **Power Cartridge** I'd be inclined to say this is one of the best-thought-out, most useful utilities I've seen to date for the Commodore 64. \$59.95 from: ACK Inc., 655 John Nuir Dr., Suite E411, San Francisco CA 94132, (415) 239-5357.

CLINICAL INTERVIEWS

Clinical Interviews presents you with an interesting twist on the old **Eliza** theme; this time you are the analyst, and you can pick from five different patients to interview. The program was developed by a psychology professor to help those in the counseling profession learn to deal with clients of different temperaments with a range of personal problems. The clients' responses depend on how skillful you are at "reading" a patient, and how well you ask your questions. You are scored on your performance, and can ask for hints if you need to. Realistic and rated R. Besides its obvious professional uses in the training of psychologists and counselors, I found it fun to just sit in the chair for awhile and let the computer take the couch. \$30.00 + \$2.50 shipping from Clinical Interviews, PO Box 69, Willard NY 14588.

PRINT MASTER

We had two wishes in regards to **Print Shop**: one, that you could preview your work on the screen, and two, that the print speed could be faster. Well, **Print Master** addresses both those points, plus giving you the capability of making custom calendars. However, it does not have **Screen Magic**, and its graphics are not compatible with **Print Shop's**. Other than that, **Print Master** works in the same way as **Print Shop**, and is generally much friendlier due to its preview option and faster print speed. Unfortunately, it is so similar otherwise that Broderbund has filed suit against its publisher, Unison World Inc. Time and the courts will tell whether **Print Master** will be allowed to stay in distribution.

Computer Club
Meets Today



This Week:
"What's new in
software for
my printer?"

Deadlines!

SUN	MON	TUE	WED	THU	FRI	SAT
	1 math exam trip	2	3	4	5	6
7	8 11th book reg?	9	10	11 hard trip (home)	12	13 book birth day
14	15	16	17	18	19 paid paper due	20
21	22 math book reg?	23 12th exam exam	24	25	26	27
28	29	30	31 chem math final			

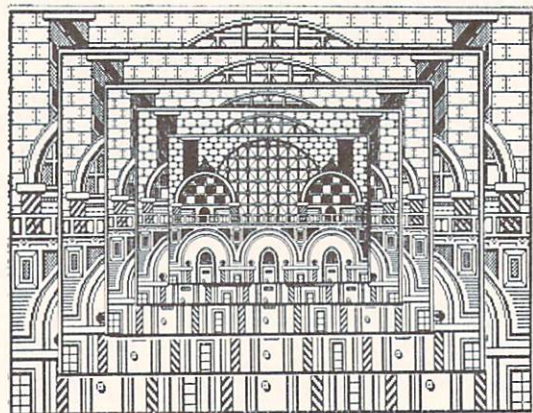
appointments

Sunday	6
Monday	7 in SPEECH Industries. at 9:30 in the Regatta room
Tuesday	8 Payment from the Lucas Team arrives today (am)
Wednesday	9 Resource update at 10:00 with Dave and Steve
Thursday	10 Review new product footage with Rand
Friday	11 Dr. Manton at 8:00
Saturday	12

NEW PRODUCTS

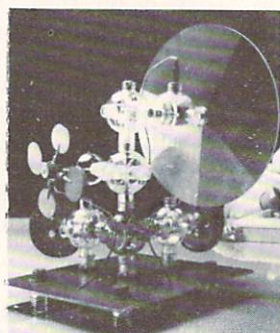
BILLBOARD MAKER

Billboard Maker is a unique program which takes pictures from almost any drawing program and converts them into signs and huge billboards. The secret to the conversion is a marvelous **optimizer** routine which does a fantastic job of smoothing out jaggles as it increases the size of your pictures. Most require no retouching at all, but if you feel the need, **Billboard Maker** saves your expanded work to disk as a jigsaw series of drawing-program compatible files which you can then edit to your heart's content. You can frame and add text to a picture with options built into **Billboard Maker**. The maximum expansion on a single picture produces a 4x3 foot dump in strips on your dot-matrix printer, though there is no theoretical limit to the size you can create, since **Billboard Maker** files can be loaded back in and expanded and optimized again as much as you want to. Though a little slow in the conversion routine, the end result is worth it. I can't tell you how inspiring the wall-sized poster of Benn is... \$39.95 + shipping from Relevant Software, 283 Mamaroneck Ave., White Plains NY 10605.



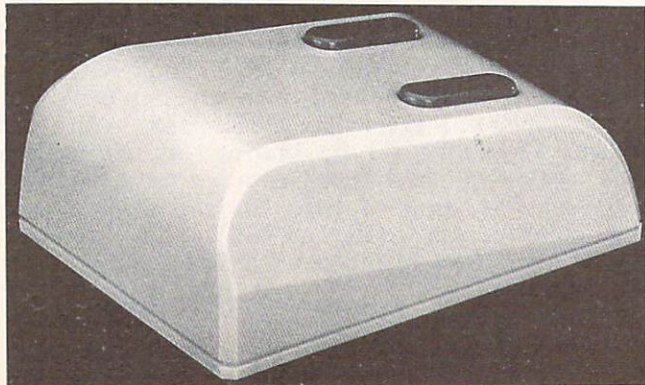
ROBOT EXPERIMENTER'S KITS

Access is marketing a series of robot experimenter's kits that interface to the Commodore 64 and C128. The **Multibots** sets range in price from \$60 to \$200, and let you build and operate automated control devices under computer control. The kits can be interfaced to Lego, Robotix, and Capsela construction sets. The included Robotics Operating System adds 23 robot-control commands to BASIC. Access Software, #A 2561 S. 1560 West, Woods Cross UT 84087, (801) 298-9077.



MIGHTY MOUSE

Though it's not necessarily coming to save the day, the **Mighty Mouse** will give you a joystick-compatible mouse for your C64 or C128. Slightly smaller than the Amiga mouse, **Mighty Mouse** is a two-button mouse that interfaces to your computer through a cigarette-pack-sized box to a joystick port. It requires no driver software. The mouse is compatible with any joystick-driven program, such as **Jane** or **Doodle!**. Suggested retail is \$55.00. Contriver Enterprise Co., Ltd., 1035 Clark Dr., Vancouver BC Canada, V5L 3J9, (604) 251-9925.



NEW PRODUCTS

WINDOWING HAS OBVIOUS ADVANTAGES IN THE PRESENTATION OF SCHEDULES:

E MONTH OF JULY	
APPOINTMENTS FOR THE 19TH	ED THU FRI SAT
MEET CHRIST AT 1 REGA HIDD RANC INVE SYST INFO STAT	<div>NOTE: REMEMBER TO CONFIRM APPT. WITH CRIS BY 17TH - CALL IN THE AFTERNOON ONLY.</div> <div>UND FERN UIS/MO 41</div>
NOTES: PARTNER IN PEEK DEV CO AND COM-SOFT.	

WINDOWS

Windows is a programmer's utility package from St. Mars Systems that lets you add windowing capabilities to your own programs. BASIC hooks let you create, move, scroll, color, and manipulate windows easily, but unfortunately there is one glaring omission: there is no routine included for formatting print into the windows you create. It is very easy to overwrite your window's borders. If this capability were added, this would be a very nice utility package. \$24.95 from St. Mars Systems, 1400 Clay St., Winter Park FL 32789, (305) 657-2018

NEW FOR THE C128

ABACUS 128 TITLES

Abacus has released C128 versions of five of their popular C64 titles. Included are their CADPAK package, a version of Super Pascal, Chartpak, Super C, and the BASIC-128 Compiler. They also sell eight books covering various aspects of the C128 and 1571 drive. Abacus Software, PO Box 7219, Grand Rapids MI 49510 (616) 241-5510.

- OUT-THINK TO THE RESCUE! - I finally get organized.
- Business Planning - Now, I can really OUT-THINK the competition.
- Correspondence
- Meetings
- Current Projects
- Staff - I'll keep my department organization charts here.
- Product Proposals - New high tech line of outdoor gear.
- High Tech Hiking Boots - Space age materials and computer design.
- Product Description
- Market Analysis
- Schedule
- Staffing Requirements
- High Tech Backpack - Ultra-light, ultra-strong materials.
- Product Description
- Market Analysis
- Schedule
- Staffing Requirements
- Status Reports - Are we meeting our objectives?
- Personal Stuff - Wow! OUT-THINK makes organizing a snap!
- OUT-THINK is Fabulous! Order enough for the whole department.

CP/M+ OUTLINE PROCESSOR

Kamasoft Inc. has introduced a C128-compatible version of their Out-Think outline processor. Running under CP/M+, Out-Think gives you a means of organizing and developing ideas and projects that is as familiar as outlining a theme in high school. You work from big ideas down to smaller ones, all the time keeping your thoughts categorized and, therefore, organized. You can rearrange sections, and access information by keyword, even if it's misspelled! For \$49.95, it sounds like a pretty powerful productivity tool. Kamasoft, PO Box 5549, Aloha OR 97007, (503) 649-3765.

MATRIX

First of all, this program is from Progressive Peripherals, not Aquarian Software as we reported last time, though Aquarian does sell it. Matrix is a unique utilities package for the C128. It is dongle-protected. Among other things, this program lets you access the numeric keypad, 80-column screen, and FAST 2MHz operation in the C64 mode. The drivers for these capabilities seem to interfere with most commercial software, so you will most likely be limited to using them only with your own programs. Also included are several programs for disk copying, including a 1571 single-drive fast burstcopier for backing up double-sided disks. One unique feature is the ability to edit and produce auto-boot loaders for any program running in either C128 or C64 mode. The loader can even autoloading several programs and execute a RUN or SYS start. The autoboot disk you produce does not require Matrix to run, and may be used in commercial software without royalty. Progressive Peripherals & Software, 464 Kalamath St., Denver CO 80204, (303) 825-4144.

NEW PRODUCTS

NEW FOR THE AMIGA



PENMOUSE +

Kurta Corporation has released a \$375.00 graphics tablet for the Amiga called the **Penmouse +**. Though it is slated to be usable as both a graphics tablet and a mouse substitute eventually, the mouse driver software is not being supplied with the product initially. The beta unit we received has some problems with RF interference and slower speed than the mouse, but it does let you sit down with a wireless pen and draw with **DPaint**. If you are a freehand artist having trouble getting used to a mouse, or if you have paper copy you would like to be able to trace into **DPaint** drawings, **Penmouse +** should get you going. Kurta Corporation, 4610 S. 35th St., Phoenix AZ 85040, (602) 276-5533.

AMIGA RAM CARTRIDGES

Two third parties have announced that they will produce 256K RAM expanders for the Amiga. Both are intended as alternatives to Commodore's own \$200 expander which plugs into the front of the Amiga. As with Commodore's unit, these may be used only as the first 256K of expansion RAM. Starpoint Software ((916) 842-6183) will retail their unit for \$120 + \$4 shipping. Skyles Electric Works ((415) 965-1735) has announced a price of \$149.95 + \$4.50 shipping.

MICRO FORGE HARD DRIVES

Micro Forge is supplying 10, 20, and 40 megabyte hard disk drives for the Amiga. (Since the 10 meg drive only costs \$79.00 less than the 20 megger, they freely admit they haven't sold many 10 meg drives.) Though we haven't had a chance to put ours through its paces yet, these are steel-cased heavy-duty units, and ours is hooked up and seems to be working fine. The power supply is a monster capable of supplying two drives and a seven-slot expansion box. At \$1494.95, the 20 meg unit is some \$500 or so cheaper than a Tecmar drive with interface (though it is nowhere near as slick in appearance). From: The Micro Forge, 398 Grant St. SE, Atlanta GA 30312, (404) 688-9464.

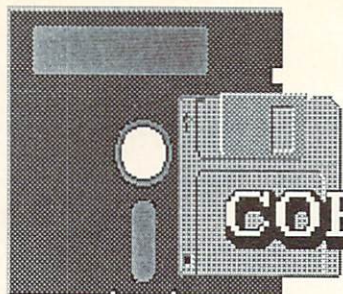
FORTRAN-77, BASIC COMPILER

Absoft is now delivering **FORTRAN** for the Amiga. The **AC/FORTRAN** compiler produces native code for the 68000 processor, and is said to have a high degree of compatibility with Macintosh and mainframe versions of the language. The version currently shipping does not support Amiga-specific graphics, sound, etc., calls, but modules to do so are under development and will be supplied to purchasers when they become ready. It is said to support 32-bit math, compile up to 1600 lines/min, and support large source-program development even on a 256K Amiga. Retail is \$295.

Also under development, with a projected release date of sometime in June or July, is **AC/BASIC**, a MicroSoft BASIC-compatible compiler for the Amiga. At \$295, it will not be in everyone's toolbox, but should be a real boon to developers, hardcore hackers, and those with special programming needs. Compute-bound BASIC programs are said to run up to 50 times faster when compiled under **AC/BASIC**.

Both are available from: Absoft, 4268 N. Woodward, Royal Oak MI 48072, (313) 549-7111.





COPY CORNER

NEW TIMES

Copy protection just keeps getting worse. Some of the latest titles include recording out to track 40, five tracks beyond what the 1541 was designed for. Many recent programs will not load on any third-party drives, or even on a Commodore 1571! We strongly suggest that you avoid titles with this degree of protection. While none of the latest protection schemes perform the notorious head-banging that was responsible for knocking many drives out of alignment early on in the Copy Protection Wars, it is our suspicion that the latest wave will be extremely sensitive to drive alignment problems and media aging. It is very likely that a program that will load today may not load tomorrow.

There are two bright news items about the Protection Wars, both regarding the arsenal of Our Side. Most of the latest revisions of copy software that we are seeing are not copy-protected themselves, reversing an early (and hypocritical) trend towards heavy protection. We hope that users will respect this, and will purchase their copies of these programs. The other bit of happy news concerns the advent of the (mostly cartridge-based) memory-dump copiers. These programs not only make working copies of most memory-resident programs, but the process completely circumvents the original disk, so the copy is itself unprotected. Copy Corner will take an in-depth look at these programs next issue.



COPY II 64/128

Central Point Software was the first company to send us an upgrade of their copy software which works with the C128 and the 1571 drive. Copy II 64/128 runs on a Commodore 64 with one or two 1541 or 1571 drives (in 1541 single-sided mode), or on a Commodore 128 equipped with one or two 1541s or a single 1571. The C128/single 1571 configuration is the only one which will allow you to copy double-sided 1571 format disks.

Copy II runs only in 40-column mode on the 128, though some of the prompts are printed in a rather haphazard fashion to the 80-column screen. It is hoped that CPS will support the 80-column display when they upgrade to C128/dual-1571 compatibility (which is in the works).

Since they can't bank on users switching to the 1571 when they convert to a C128, software companies are sticking with 1541 format for their products; there is no such animal as a copy-protected 1571 disk. Therefore, 1571 compatibility for a copy program is simply a matter of implementing the faster burst routines and making sure both sides get copied. Copy II now does both, making quick and accurate copies of 1571 disks in four passes.

Copy II still tackles the toughest 1541 copy-protection with some of the sharpest teeth available. And it copies itself; it always has. If you need 1571 copies it'll do them, besides providing you with a great 1541 copier. If you have or are planning to get two 1571s, wait a couple of months for the upgrade.

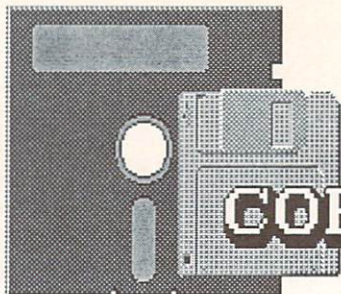
Copy II 64/128 is \$39.95 from:

Central Point Software
9700 SW Capitol Hwy. #100
Portland OR 97219

LATEST UPDATES

Ultrabyte version 2.1 has received several improvements and modifications over its predecessor. It is now claimed to copy all but about a half dozen of the most heavily protected disks. Besides the single-1541 heavy-duty nibbler, this version also contains MSD dual drive and dual-1541 copiers that are faster (70 seconds per disk compared to about 3 minutes) than the single-drive version, but are correspondingly somewhat less powerful. For the tough stuff, Ultrabyte now includes a parameter copy option with smooth-scrolling menu selection of about 90 titles, from Acro-Jet to Winter Games. It now even copies itself!

Version 2.0 was one of the best of the last wave of copiers, and it looks like Ultrabyte is committed to staying right near the top. \$39.95 (or \$10.00 + original disk for updates) from: Ultrabyte, PO Box 789, LaCanada CA 91011, (818) 796-0576. By the way, if you need disk utilities like track and sector editing, file copying, error writing, etc., Ultrabyte supplies



COPY CORNER

continued

them as a separate package called **The Disk Surgeon** for \$14.95. Include \$4.00 shipping on all mail orders.

Fast Hack'Em from Basement Boys Software remains one of the most unique programs ever written for Commodore machines, due mainly to its capability to program an MSD dual drive or two single drives to act as a disk duplication system completely independently of your computer (see Mindy Skelton's in-depth report last issue). It still copies itself, and the latest revision includes an even bigger potful of parameters for tough programs, including some of the latest and greatest. It is also now C128/1571 compatible, providing double-sided copies on a single 1571 drive. \$29.95 plus \$3.00 shipping (\$6.00 + your original disk if you are updating from an earlier version) from: Basement Boys Software, PO Box 30901, Portland OR 97230 (503) 256-5506.

Di-Sector is now up to version 3.0, and has amassed some substantial improvements along the way. First of all, it will now make unlimited copies of itself, thus joining the ranks of the Honest Copiers. Though it will work with a C128 in C64 mode, and a 1571 in 1541 mode, DS3.0 has not been upgraded to duplicate double-sided disks, and does not support the MSD dual drive for nibble copying.

It does, however, have a new parameter copier built-in, unique in the fact that it does not require the operator to input the name of the program being copied. About 40 tough programs are supported in the initial batch, with updates to follow. **Di-Sector** has always also included many additional disk utility programs, which makes it one of the best expert copiers around. Included are a m/l monitor which supports undocumented opcode disassembly and access to disk drive memory, a fast formatter, error checker/maker, disk editor, block identifier, and others. The Electronic Arts backup utility is unique in that it is claimed to actually remove the disk error protection checks from the EA boot program. The documentation is superb, and fun to read. (Check out Recommended Reading, and the Don't Read This file on the disk.) \$39.95 (\$5.00 + original disk for updates) from: Starpoint Software, 122 S. Broadway, Yreka CA 96097, (916) 842-6183). Add \$4.00 per order for shipping.

It came in just too late to boot up and test, but the latest **CLONE MACHINE** from Micro-W has been upgraded to provide C128 and 1571 compatability. Included are a choice of three "GCR" 1571 copiers, as well as the familiar arsenal of disk editing, formatting, file copying, etc., utilities you've come to expect from the **CLONE MACHINE**. There is also now an integral parameter copier for the real "tough nuts". \$49.95 (\$39.95 for updates) from: Micro-W, 1342B Route 23, Butler NJ 07405, (201) 838-5606.

COPIER SOFTWARE PUBLISHERS: Don't forget to keep INFO appraised of your latest products, updates, and revisions!



BRIAN REDMAN'S COMPUTER GLOSSARY



HIGH MEMORY

Magazine Index

INFO's guide to the best from the rest.

Here's a list of the best Commodore-related articles in the other computer magazines since our last issue:

BYTE has a good long look at the Atari 520 ST in the January issue, along with a feature section on robotics that's pretty interesting. The February issue contains an introduction to the Amiga's ROM kernal, plus an article on the development of AmigaDOS, and a textual summary of some of the best Amiga information from the Byte Information Exchange (BIX) BBS. The March **BYTE** has a preliminary article on the one-megabyte 1040 ST from Atari, plus another installment of the best of BIX. Bruce Webster's March "According to Webster" column begins a multi-issue comparison of the Macintosh, ST, and Amiga. One of the more memorable quotes from the first installment: "If it (and Commodore) can survive the next six months, the Amiga could easily be around for 5 to 10 years, long after 520STs are gathering dust on closet shelves."

For you AI buffs, **Computer Language** magazine is starting up a new title this month called **AI Expert** that looks like its going to be the AI forum. Check out the April Fools' issue of **Computer Language** for some great computer humor (including "Computing at Chaos Castle").

If you can't find **Doctor Dobb's Journal**, it's because they changed the name to **Software Tools** in January. The January issue focused on the 68000.

The Transactor, though still somewhat irregular, remains a necessity for serious Commodore programmers. The January issue focuses on Implementing the Sciences, with articles on 3D graphics and a microsecond timer for the C64, among others. The May issue includes drop-down windows and a Dvorak keyboard driver for the C64, and reference sheets for AmigaDOS. They are also readying **The Commodore Inner Space Anthology Volume II**. If it's as indispensable a reference as volume I, you'll want to have it.

COMPUTE! is still milking the Speedscript series with Commodore, Apple, and Atari versions of a compatible spreadsheet called **Speedcalc** in the January, February, and March

issues respectively. A two-part tutorial on AmigaDOS appears in the January and February issues. The March issue is particularly interesting in that it contains the first magazine type-in MicroSoft Amiga BASIC program published.

COMPUTE!'s Gazette published a memory map of the most important C128 locations in their February issue. Most of the rest of the pages of the January, February, March, and April issues are devoted to type-in games and utilities.

The Dec/Jan **Power Play** featured tutorials on binary and the Amiga Workbench. A hexadecimal tutor followed in the Feb/Mar issue, along with an extensive BASIC add-on called PGM. There's an unexpected article on the relatively complex topic of linear programming in the Jan/Feb issue of **Microcomputing**, as well as a longer C128 memory map than the one published by **Gazette**.

The November issue of **The Guide** contains a list of C128 BASIC tokens. While we consider publisher Randy Chase and company to be good friends, we've got to say that the April issue lacked substance. Most of the magazine is taken up with dated, glossy overviews of the Atari ST, C128, CP/M, etc. Since they are an independent voice, we'd like to see **The Guide** make it, but they'll need more meat to do it.

For you hardware hackers, both the January and February issues of **Ahoy!** include hardware construction articles that are C64 related: a talking clock in the January issue, and an autostart cartridge project in February. Dale Rupert has an AI Nim-playing program in the February issue, and his Commodores are still providing programming challenges. Check out the editorial page of the February issue for kudos to **INFO**.

The Jan/Feb **Amiga World** has a look at both TLC Logo and Cambridge LISP, as well as a nice Digital Canvas section. Unfortunately, Digital Canvas is pared down to a measly two pages in the Mar/Apr issue.

The annual Special Issue of **RUN** was worth the money just for the complete all-in-one-place, indexed MAGIC tricks, if nothing else. The regular February issue contains a breakthru 80-column hires graphics driver program for the C128.

COMPUTER MAGAZINE INDEX

continued...

The **Midnite Software Gazette** is building back up in size from a mere 16 pages to a high of 42 pages in NOV/DEC. (Publisher Jim Oldfield says they're almost sure to be monthly as intended from here on out...) They've added some type-in utility programs of late, such as the BASIC Cross-Reference listing in #28. #29 had a close look at comparative language speeds on the C64 that's a real eye-opener. (The language was not nearly as important as the individual implementation of it!) There's also a review of Watcom Pascal, as well as a couple of dozen user reviews per issue, as usual. By the way, most newstands carry the other mags, but since Midnite is kind of hard to find, call 217-356-1884 for subscription info.

COMAL Today has been laser-typeset for the last three issues and looks pretty sharp. Now that COMAL is the third most popular C64 programming language (after the built-in BASIC and professional-choice assembly language) we expect the COMAL Users Group to grow fast. Issue #9 included the COMAL-compatible **Sizzle** fastloader, and (on the companion disk only) a graphics icon editor for Broderbund's **Print Shop**, among other things. The latest **COMAL Today** (#11) includes COMAL utilities for pop-up applications, automatic disk error detection/repair, and several others. There are also listings of the contents of all the COMAL disks, plus COMAL 2.0 keywords, COMAL suppliers, etc.

NETWORK WARS

by Peggy Herrington

Local Multi-user Gaming Systems

There are two popular forms of recreational online services: privately owned electronic bulletin boards and national commercial networks. While they're both tried and true, the latter can become prohibitively expensive and calling local boards offers limited variety and even less human interaction.

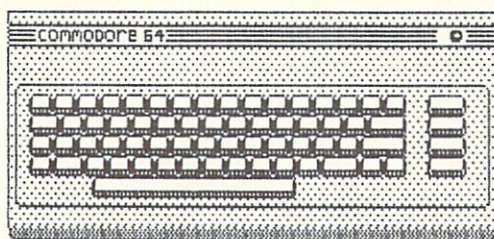
A company called InterPlay, Inc., is offering an alternative to this dearth of affordable online action with interactive gaming. By April 1st, their multi-user Scepter systems will be available in over 20 metropolitan areas. Company president Dennis Flanders says systems will be up and running in over 100 locations by late 1986.

Up to 16 callers can be accommodated simultaneously on a Scepter IBM-PC-XT equipped with a special Unix-like operating system. In addition to participating in live conversation and messages, callers can create and assume identities of Dungeons and Dragons-type characters for adventuring in the medieval, automated fantasy role-playing game, **The Scepter of Goth**. Traveling alone online or in groups, players encounter a multitude of evil creatures. It is by defeating these creatures or other players through combat, magic or skillfulness and by accumulating treasure that individuals advance to the next level of expertise. The system generates and controls non-player characters in 4,096 distinct playfields, and constantly changing mini-adventures or quests provide opportunities for players to rescue fair maidens and such. Online charges for Scepter vary from \$2.00 to \$3.50 an hour (billed by the minute) depending on its location:

Atlanta GA	Minn/St.Paul MN
Austin TX	Newport RI
Boston MA	Phoenix AZ
Brooklyn NY	Princeton NJ
Chicago IL	Salt Lake City UT
Denver CO	San Diego CA
Las Vegas NV	San Francisco CA
Los Angeles CA	Seattle WA
Manhattan NY	Toronto Canada
Milwaukie WI	Washington, D.C. (2)

Everything from non-player characters to entire new worlds can be created by Scepter SYStem OPERators (SYSOPs) with an online editor. SYSOP positions are open across the country and require a \$7,000 bond. InterPlay supplies and installs all equipment, provides online instruction and assistance in building a user-base and splits the income 50/50 until the bond is recovered; thereafter the SYSOP receives 30%. Call toll free 800-826-3286 for local Scepter telephone numbers and more information, or write to InterPlay, Inc., 10875 Main St., Suite #210, Fairfax VA 22030.



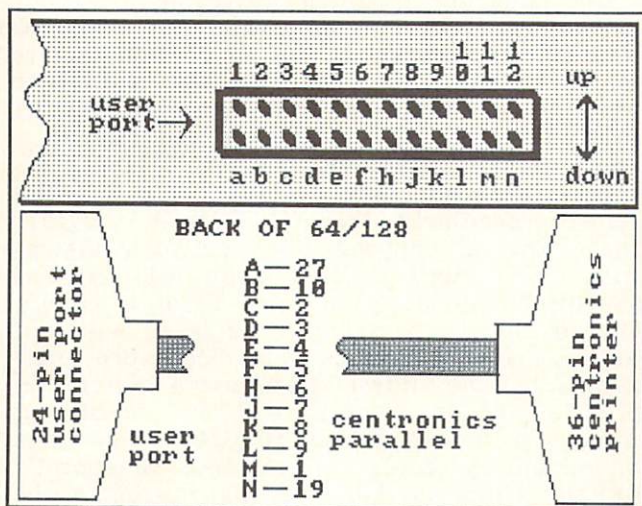


C64 NOTES

PARALLEL PRINTER INTERFACING

One of the best-kept secrets of C64 computing is that it is relatively easy to drive a Centronics parallel printer directly from the user port at fast parallel speeds. Though the Commodore 64 and C128 do not themselves support direct parallel printer output, many programs include the parallel printer driver software that makes this method work. Among the titles that do are Superbase, Paperclip, VisaWrite, the Power Cartridge, and many others. The Power Cartridge (see NEW PRODUCTS in this issue) even lets you use a parallel printer from within many programs that do not directly support parallel printing.

You can make the necessary cable by wiring a standard Centronics printer connector to a user port pc card edge connector, following the pinouts in the diagram we've included here. If you can't find the connectors, or just don't want to do the work yourself, you can get ready-made cables from Redmond Cable (206) 882-2009.



Not only will this method of connection free up a serial port connector in your system and save you the cost of a serial-to-parallel printer interface, but it also gives your C64 truly fast parallel printing speed.

ARE YOU THERE?

If you have written a program in BASIC that works with the printer, you know how frustrating it can be to find out that the stupid thing is off-line only when your program crashes. Well, this simple routine can check to see if your printer on, and to prompt you to turn it on if it isn't.

```
1000 REM Detect Printer (Device 4)
1010 OPEN 1,4
1020 PRINT#1,"";
1030 CLOSE 1
1040 IF ST<>-128 THEN RETURN
1050 PRINT "TURN ON PRINTER"
1060 PRINT "(HIT ANY KEY)"
1070 POKE 198,0 : WAIT 198,1
1080 GOTO 1010
```

32-BIT CHAUVINISTS

If the Atari 520ST and Amiga owners are getting to you with all their gloating about how great their 32-bit computers are, just say "Oh yeah? Well I'll bet your big expensive machine can't even beat my Commodore 64 in just a simple little test like, for instance.....A Simple Printing Loop!" Then have them boot up BASIC (all the while pointing out that you don't have to boot up BASIC since you already have it in ROM). Then have them type in this simple program:

```
10 FOR X=0 TO 1000
20 PRINT X
30 NEXT
```

That's it. Make sure their output window is set to full-screen display size before they run, and time this program on your C64 and on their machine. I guarantee you'll win. Why? It's very simple. The C64 only has to move 2000 characters when the screen scrolls (1K for character information, 1K for screen color info). The 32-bit machines do everything, even printing text, on a hires graphics screen composed of thousands of bytes of data. Your C64 wins because of screen scrolling times, not computational power. But don't tell them that.

By the way, if they argue about accuracy, ask them to compute 58 squared on the ST or Amiga. Your C64 will be 100% right. The Atari will be off by .1, and for some strange reason MicroSoft BASIC on the Amiga is off by .5! If they question you, suggest they try squaring 68 or 87. Almost everything is off by .1 on the Atari, and just these three numbers on the Amiga under MicroSoft BASIC are off by .5.

Lt. Kernal

The latest hard disk drive for the C-64

While we were in the process of looking at the Lt. Kernal, plans finalized for the product to switch manufacturers. We hope to be able to review the new version of the Lt. Kernal as soon as it becomes available.

Fiscal Information Systems Inc. has been shipping the Lt. Kernal hard disk drive for the Commodore 64 for several months now. Could this be the hard drive Commodore owners have been waiting for? Maybe...but not quite yet.

The unit we examined is a 20 megabyte unit, identical to the 10 megabyte Fiscal drive except for the drive mechanism itself. The guts of Fiscal's drive boxes can support two hard disk drives of almost any capacity internally, and the DOS can control up to four drives in custom configurations.

The controller is contained in an oversized cartridge that plugs into the expansion port at the rear of the C64 and connects to the drive via a ribbon cable. It is compatible with the Commodore 64, and with newer C128s. We began our tests with an off-the-shelf interface, but finished with a prototype of their new phantom-cartridge operating system.

The Lt. Kernal has been licensed to a new manufacturer, Cardco, Inc. List price on the 10 megabyte Lt. Kernal has been \$1595, but by licensing the product to Cardco, the price of these units will drop dramatically. Cardco has already announced the following prices for their models: \$599.95 for 5 megabytes, \$899.95 for 10 megabytes, and \$1299.95 for 20 megabytes. Cardco has also said that there will be some changes in the drive. The DOS will continue to be updated and maintained by Fiscal, who will provide periodic updates through Cardco.

The Lt. Kernal is a solidly built fan-cooled unit with an integral power supply. The drive is a 5.25 unit by NEC, though Cardco is shopping for another supplier. The front panel has only a drive activity light. The rear panel has a fuse-holder, power switch, and two cable connectors. One goes to the controller, and one is for the optional streaming-tape backup unit. The power switch is unlabeled and recessed and difficult to reach beneath the cable connectors.

Hooking up the Lt. Kernal is a snap. You just plug everything together, and remember to

turn on the computer last. On power-up with the drive active, the screen message tells you that you have the Lt. Kernal operating system engaged, and gives you a status report on the drive. If there is a program named AUTOSTART on the drive, it will load and run automatically.

The Lt. Kernal operating system wedges into BASIC and provides many extensions to the language, most having to do with hard drive operation, though there are several programmer's tools like RENUMBER, DELETE, MERGE, and AUTO line numbering.

The drive itself can be subdivided by software into up to ten Logical Units that work like independent drives. This gives you control over unwieldy disk directories; each logical unit can still hold up to 4000 entries. The CONFIG utility program takes care of allocating disk space to these logical units. You have to keep track of where the disk space is allocated in the event of a system crash. In case of such a crash, SYSGEN is the command which will recover your drive. It loads the operating system back into the hard disk from a copy on floppy disk. This is also the way you load in operating system updates.

File handling is much the same as under Commodore DOS, but improved. For example, INPUT# strings can be up to 255 characters instead of only 80. There is also a BUILD command to create relative files. SCRATCH with wildcards only works on one file at a time, though there is an AUTODELETE program that will delete whole blocks of files at once. Similarly, the AUTOCOPY program takes care of copying files between logical units. TXA will quickly copy all matched sequential and program files from a floppy disk to the hard drive, though it will not handle relative files or copy-protected software. The latest transparent interface, which is what Cardco will be supplying, includes a utility called ICQUB which is a whole-memory copier much like Starpoint's ISEPIK. From our brief testing, it seems to be fairly effective at copying memory-resident programs to hard disk, though it did not work 100% of the time. Of course, it will not work at all with programs that must load modules in from disk, unless the modules can be transferred with a simple file-copier.

Lt. Kernal

continued...

Other commands let you change the hard drive's device number, switch back and forth among logical units, display the disk directory, etc. Other features let you simply type a program's name to have it load and run, or AUTOACCESS a floppy drive. AUTOACCESS lets you have a floppy disk connected to the computer with the same device number as the hard disk (typically #8) and ask to load a program. If the operating system does not find the program on the hard disk, it will go on to look for it on the floppy.

Besides the added storage and file management capabilities you get with the Lt. Kernal, it is just plain FAST! In our experience, it loaded files up to fifty or so times faster than a 1541 disk drive. It's fun to watch graphics screens flash by on the C64 so fast that you can hardly tell what they are.

Because of the unusual way in which Superbase handles its files, the Lt. Kernal is incompatible with this most popular of Commodore database managers, though it is claimed that a special version of Superbase is under development that will take advantage of the Lt. Kernal's capabilities. We'll wait and see. It also remains to be seen whether other popular productivity titles will be compatible with the final Cardco drive.

The original controller cartridge made use of the 8K of RAM under the C64's KERNAL ROMs. Understandably, this made for a lot of incompatibility with commercial software. The new phantom cartridge controller is much better, though we still found some titles that would not run properly. Easy Script, for example, ran but suffered from a very fast nervous cursor. Paperclip almost worked, too, but had a half a screen of garbage text that could not be cleared. Hopefully, the final version will be more compatible.

Since the controller steals time away from the operating system, it does slow down the operation of your programs. Doodle!, for example, worked great, but ran noticeably slower. (The picture load times were incredible, though!)

Physically, the cartridge provides a reset button for use with the ICQUB program, plus a standard cartridge slot on top (which may not be there in the final version). The transparent version includes a plug-and-cliplead

combination that connects internally to the C64 in exactly the same manner as Battery Included's Buscard II IEEE interface.

In its Cardco version, the Lt. Kernal should have a FASTCOPY program available that will allow you to backup 10 megs to 1541 disks in from two to four hours (on 60 floppies!). Actual backup times will vary depending on how full the hard drive is and whether you are performing a full or update backup. It seems to us that the most reasonable and practical solution to the hard disk backup problem is to use a streaming tape cartridge backup unit. The Fiscal Lt. Kernal supports such a unit (though its cost is \$1299), but the Cardco version will not support the streamer.

Since what we saw is not what Cardco will be selling, we're going to have to reserve judgement on the Lt. Kernal for now. All we can say is that it shows promise. Fiscal has shown great interest in making their drive as useful as possible; they have been very open to suggestions and criticisms. We hope that Cardco will share this attitude, and will also aim for as much software compatibility as they can, while keeping their drive as solid and well-built as the Lt. Kernal is now. Cardco hopes to have the 5 megabyte unit on the market by the time this issue hits the stands. Watch this space for more INFO as it becomes available.

THE LT. KERNAL DOS

The hard disk operating system supplied with the Lt. Kernal is a real joy to work with. Most of the main features of the Lt. Kernal DOS are outlined in this article, but a simple listing of commands can't give you the feel of working with this DOS. It effectively gives your lowly Commodore 64 many of the advanced features of a CP/M or MS-DOS environment. Though we are unsure of what changes the hardware might undergo in the final Cardco version of the Lt. Kernal, we have been assured that the DOS is in its final form, bar updates. Though we don't usually rate individual features of products, we feel that taken by itself the Lt. Kernal DOS would rate ****.



Super C Power

TWO C COMPILERS FOR THE C 64

WHY C?

C is here to stay. It is the structured programming language of the eighties, and it is gratifying to see not one but two C compilers become available for the Commodore 64.

Why is C so popular? There are a couple of good reasons. First of all, C is a **programmer's** language. C will not replace BASIC as a personal programming language. BASIC is a good interactive language (COMAL is better) for playing around with your computer, or even for developing applications for your own use, but when it comes to developing commercial software, you need more powerful tools. Professional programmers have traditionally leaned on assembly language as their language of choice, because it is powerful, compact, and executes quickly. However, it is difficult for a mere mortal to contend with, since it is a dialect of the computer's own tongue. Some applications can be written in Pascal or COBOL or some other language and compiled into fairly decent run-time code, but these do not allow access to low-level machine functions the way assembly language does.

C offers the best of both high-level languages and assembly. It is a structured language, and reads a lot like Pascal. It has math functions, conditionals, loops, and all the other high-level language features one would expect. However, C is a bare-bones language. There are no functions to take care of graphics, sound, or even input and output! These tasks are all performed by **library functions**. The logic is this: such things are machine-specific. It makes sense to make everything that is generic to all computers part of the C language, and implement other functions in machine-specific libraries, implemented by standardized calls. Then code written in C can be ported directly to new machines. The I/O and other specific functions will be implemented in libraries written for those machines, invoked by the generic library calls. No wonder programmers like it! They only have to write a program once, then it can be ported to many machines.

At least that is the theory. In practical application, every C compiler is a little bit different. There are especially major differences in the libraries.

The upshot of all this is that you can theoretically use either of these new C compilers to write applications not only for the Commodore 64, but also for the IBM PC, Macintosh, Amiga, and even VAX! In practice, the C source you create with these compilers will not be compatible even with each other without some translation and adaptation.

THE STANDARD

The standards for the C language were established by Kernighan and Ritchie of Bell Labs, the originators of C, in their book **The C Programming Language**. Both the C versions reviewed here support the full Kernighan & Ritchie standard with the exception of bit fields. This is not a crippling, or even an unusual omission. Many C compilers for the IBM PC are missing some functions, and bit fields are among the most common omissions. Most C source you run into should not have a problem with this omission, and you're not likely to miss it as you write your own code, either.

One thing that will slow you down, however, is a lack of extended support libraries to do the things that the C core language doesn't do. For example, Lattice C for the Amiga includes support libraries to access all the Amiga's special graphics, sound, and speech capabilities.

Both **Super-C** and **C Power** include the standard I/O library, but that is all you get with **Super-C**. **C Power** is a lot better fitted out, and includes directory management, string function, and math libraries. Unfortunately, neither package includes libraries for sound or graphics support. More than any other language, C is limited by the library functions available for it. It is hoped that the publishers and users of both these compilers will work to prepare and distribute extensive support libraries as soon as possible.

Super-C



Super-C from Abacus is their newest import from West German software giant Data Becker.

It is a modular package; from the main menu you can load five different modules. The User function lets you load and run a C application.

The Copy module provides DOS functions, including file copying. The Editor is for writing C source files, and the Compiler turns those source files into linkfiles. The Linker, the final step in the chain, links together linkfiles and produces stand-alone executable programs.

The 200-page looseleaf manual covers each of Super-C's modules in detail, providing tutorial examples, glossaries, a table of contents, an index, and appendices. Almost 50 pages are devoted to a tutorial and reference section on the C language itself.

The Editor provides 43K of document memory in two text buffers, one of which can be used for disk directories, error files, notes, etc., while you edit your C source file in the main buffer. You can color sections of your C program to highlight the program structures if you wish. The only thing I found annoying about the editor was having to insert blank lines at the end of my file to give me space to write into. Since C uses a couple of strange symbols, the C Editor uses a custom character set and reconfigures some of the C64's keys to provide them. This editor gives you most of the functions of a good wordprocessor, including block move and delete, search-and-replace, and printed output with several options. You can also cut text from one of the buffers and paste it into the other, allowing you to reuse portions of source from one C program in another. Unless you are a little creative, Editor files may be hard to pass to other text processing programs since they are saved in USR file format.

The Compiler produces both a linkfile and an error file. The error file is meant to be a help in debugging--it can be loaded into the extra text buffer and referenced while you edit the source in the main text area. The linkfile is saved to disk, where it is picked up by the Linker, which links together the modules needed to make a stand-alone program. This process may seem complex to you if you are used to an interpreted language like BASIC, but it is, believe it or not, the way most languages work.

Super-C supports all the C data types, including double precision floating point to 16 places and long integers to +2 billion.

Super-C is easy to work with, but sometimes it seems to have its own syntactical rules. Despite all my finagling I could not find the cause of the PARAMETER MISMATCH IN LINE 0008 which kept the sample program from compiling. I tried adding and removing spaces, rephrasing the statements, renaming variables, etc., all without a positive result. (The original source compiled without error under C Power.) The manual was not much help in trying to track down the problem, either. Other short programs we tried invariably seemed to have some problem meshing with the Super-C compiler. Though the math specs are superior for Super-C, it looks to me like C Power is a more standard implementation of the language syntactically.

By way of comparing relative size of compiled code, a 3-block long sample program on the Super-C diskette compiled into an executable object file 33 blocks long which would run independently under BASIC.

Super-C has just two major problems. (1) It is not compatible with textbook C code, and the differences are not spelled out in the manual, nor are they intuitively obvious. Some of them I never did figure out! Given this, it is going to take a lot of time and exploration for you to make Super-C work right. (2) There are no libraries other than the standard I/O library. Anything you want to do will require the extra effort of writing your own libraries. If you are really interested in C on the C64, I suggest you read on.

Super-C is \$79.95, and is available in both C64 and C128 versions, from:

Abacus Software
PO Box 7211
Grand Rapids MI 49510
(616) 241-5510

C Power



Pro-line's **C Power** takes a little different approach. It too is modular, but offers a shell program rather than a main menu. The shell gives you DOS and system commands plus the ability to execute the editor, the syntax-checking editor, the compiler, and the linker.

C Power's manual is no more than 44 loose-leaf pages without a binder and provides a bare minimum of documentation. It is supplemented by the inclusion of Sams excellent 500-page **C Primer Plus** tutorial textbook for the C language. As tutorial and general reference, this package excels. But as documentation for this particular C compiler....well, you'll have to figure out a lot of it yourself.

There are two editors for **C Power**; the first is an excellent screen editor with full wordprocessing capabilities including search-and-replace, cut-and-paste, etc. The **C Power** editor reconfigures the character set and keyboard to provide for C's strange characters, just as **Super-C** does. As many text area buffers as you need can be allocated simply by naming them. This editor gives you a 30K workspace. The second version of the editor, **ced**, gives you all the same functions but cuts your free memory down to 18K. In return, you get syntax-checking, a valuable time-saver in a modular compiler system. One annoyance is the lack of continuity of command syntax between the shell and the editors. For example, **l** lists the directory from the shell, but **dir** is the corresponding editor command.

The compiler produces linkfiles, from which the linker produces stand-alone applications programs. This package will let you use two drives, which cuts out most of the disk swapping during the compilation process.

C Power also supports all the C data types, but treats double precision the same as single precision, with the same 6-digit accuracy as in BASIC. Long integers are treated as short integers, in the range of $\pm 32K$.

C Power seems able to handle textbook C source code without a hitch. I tried several short programs, and all worked without problems. It also produced more compact run-time code than **Super-C**; the **NUMGUESS** program source was 5 blocks long and compiled into a BASIC-executable file only 12 blocks long.

Here are my three major complaints with **C Power**: (1) There are no libraries for graphics and sound support. A demo graphics program supplied on the disk makes it painfully clear that such libraries exist somewhere. Pro-Line would be doing everyone a favor if they made these available. (2) **C Power** is no more powerful mathematically than BASIC. I would like to see true double precision and long integers. (3) It needs a bigger and better manual. It takes some fishing to figure everything out now. Taking these shortcomings into account, author Brian Hilchie has otherwise done a marvelous job of bringing a high-power high-level language to an inexpensive eight-bit machine.

C Power for the C64 (available soon for the C128) is \$99.95, from:

Pro-Line Software
755 The Queensway East, Unit 8
Mississauga Ontario Canada L4Y-4C5
(416) 273-6350



C64 WORDPROCESSORS

by TED SALAMONE



C64 WORDPROCESSOR ROUNDUP

Close the curtains, turn your 64 off and your stereo on. INFO is about to take you on a wordprocessing adventure the likes of which you've never seen before. Sparing no expense (well, almost none) we've rounded up about two dozen word processors for the Commodore 64. After months of careful review, and more Excedrin headaches than I care to remember, the ultimate WP article is finally ready.

In addition to stand alone wordprocessors, I've also included those which are actually modules within integrated programs. Examples of the first would be PaperClip and SuperText; the latter type include the word processors in The Write File, Trio and Home Pak. (A future article will deal with the integrated programs in their entirety).

As with all comparisons there are qualitative as well as quantitative factors to consider. Personal preferences have been restricted or weeded out as much as possible in an attempt to provide factual, unbiased reviews of these programs. We don't want you to spend one dime of your hard earned money on software that's more valuable as a blank disk.

CREATIVE WRITER

Creative Writer from Creative Software is a stand alone program that integrates with its sibling spreadsheet and database titles. Whether judged on its own freestanding merits, or those related to the integration process, Creative Writer exhibits numerous strengths and very few weaknesses.

Because it is completely menu driven, I found it deceptively easy to master. This was true despite the wide range of capabilities designed into the program. Compared to equivalent software, on a dollar for dollar basis, Creative Writer is hard to beat.

The manual is well organized. It contains a Table of Contents and a surprisingly complete index. Topics include necessary hardware, manual conventions and program capacities.

From the main menu it's possible to clear memory, save, load, write or delete documents. All with just a few keystrokes! Other options

Two PALM SPRINGS society women got

their hair done by Raoul, a famous Hollywood hairdresser. One day they both decided their coiffures needed attention and they called the salon. Raoul was all booked up and he told the ladies it was impossible. After some thought, however, he phoned each of the women back and said he could squeeze one of them in. Whoever got there first would get the appointment.

As soon as he hung up, the first woman raced to her private jet and headed out. A few minutes into the trip, the plane developed engine trouble and had to land for repairs. Meanwhile, the second woman jumped into her helicopter and made it to L.A. in record time. She rushed to the salon and got her hair done. The moral of the story? The whirlybird gets the perm.

include page formatting, output preview, printer output, and file and disk handling utilities. As needed each of these contains submenus for customized output and increased flexibility.

Cursor movement is nearly identical to the normal Commodore 64 keyboard functions. INST/DEL, the CLR/HOME and CRSR keys work as they do when entering BASIC programs. Blank line insertion and deletion is accomplished with the INST/DEL key when the cursor is on a blank line. SHIFTed INST/DEL allows text insertion (without overwrite) in the main body of any document; F1 and CLR/HOME (SHIFTed and otherwise) move the cursor to the bottom and top of the document respectively.

Though text display is limited to 40 columns, the preview document screen shows output as a graphic rendition of the page. In other words, lines are used to show text placement; the text itself isn't depicted.

Printer output options include number of copies desired, automatic pagination (starting at designated page number), a pause feature for paper and font changes, and the choice between Commodore and standard ASCII output.

Paper width and length, margin set, justification, centering, header/footer placement and line spacing are all easily altered. Besides blank disk formatting, the utility functions provide horizontal and vertical print tests. Additionally, the word count/number of lines used and remaining (for any document in memory) can be had at the touch of a key.



C64 WORDPROCESSORS

continued...

Text can be deleted by the word, line, sentence or paragraph. Thanks to the 20 line buffer it can also be restored painlessly in case of an error. Beyond this, there's a 200 line copy/move text buffer for text realignment and alteration. Combine these advanced features with a string (up to 32 characters) search and replace function and Creative Writer becomes a powerful word processor indeed!

Imbedded print commands include force new page, tab control and a keep function which eliminates widows and orphans. Nonprinting comment lines (akin to REM statements in BASIC) serve as electronic memo pads in the midst of the specified document.

Variables are inserted as needed or desired to access the special fields created by other programs. Creative Writer will load these from document disks, merging them with form letters or reports. It's also possible to link documents, thereby skirting the already generous 700 line (per document) limitation.

Creative Writer provides functions and features not found on some word processors costing many times more than its \$49.95 list price.

THE WRITE FILE

Our next selection is a module from not one, but three, integrated packages marketed by International TriMicro. The word processing portion of The Write File found in their Home Office offering is the same as that found in Harmony (a.k.a. Teammate). What's more, TriMicro got even more mileage out of this code by selling it to Commodore for inclusion as firmware in the ill-fated Plus 4.

The Write File/Home Office (hereafter known as WFHO) program is targeted for home and small business use.

Instead of weighing users down with reams of instructions, TriMicro has managed to keep the manual to a mere 33 pages. After the Table of Contents there are three pages of non-removable quick reference cards. Having them bound is a real hassle. Next on the agenda is a brief description of the program's capabilities, as well as a list of required hardware.

There are some unusual numbers associated with WFHO as far as lines of text per file and number of characters per line are concerned. Only 99 lines can be accommodated per file, each composed of a maximum of 77 characters. Though unorthodox, the 77 character line (displayed 37 at a time) just takes some getting used to. The length limitation is another matter altogether. Though 99 lines are enough for simple home applications, there is not enough room for most business or school uses. When those times arise, WFHO fails to make the grade.

You're not out of luck entirely. Long files must be saved in sections, then merged upon hard copy output. It is not a difficult procedure, not very time consuming; the setup just isn't as convenient as it could or should be.

Besides the basic word processing functions like insertion and deletion of individual characters and lines of text, WFHO offers a fine search and replace routine. Specified terms are highlighted in a sequential, user controlled procedure which permits customized, one word at a time changes.

Up to 15 lines of text can be copied or moved, enough text for all but a word crazed minority. One nice touch along similar lines is the recall function; the ability to undo just crased text. This can be a real lifesaver when the pressure's on.

Let's back up a bit; I've gotten ahead of myself. Among the important features of a word processor, cursor control ranks near the top. How easy, how varied, how fast? These are all legitimate concerns for the end user.

Besides the standard CRSR and RETURN (linefeed) keys WFHO provides other ways to maneuver. F7 jets the cursor to the right of the page (current line), while F8 does likewise for the left.

CLR/HOME sends the cursor to the top of the file, but not where indicated in the manual. Instead of the uppermost left corner, the cursor remains in its current column. SHIFT CLR/HOME performs in much the same manner for the bottom of the file.

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Finally, CTRL LEFT ARROW sets tabs which are accessed by depressing the unshifted LEFT ARROW key. A word to the uninitiated: WFHO automatically sets a tab at line 77. Except for this single pre-ordained setting all tab locations are displayed on the status line at the bottom of the screen.

The other major portion of the word processor concerns itself with printer output. Numerous ASCII based commands can be inserted into the files to drive printers. Dependent upon the hardware itself, features like boldface, shadowprint, underline and enhanced mode are supported. These commands, and how to use them, are surprisingly well documented.

Page formatting commands include the usual set page length and margin widths as well as justify, wrap, and pause (to change paper or print wheels). Other options include pagination, file linking (you'll really use this one), line spacing and adjustment to paper size.

There is a blind spot. These commands (text embedded in reverse video mode) work only on printer output. That means there's no way to view formatted work before ink goes to paper. Experience can minimize this oversight; nothing can compensate for it entirely.

WFHO is a curious mixture of primitive methods, advanced features and downright curious elements. It will probably wind up on Ripley's Believe It or Not. While it works fine, there are too many superior products available for me to recommend this one.

SUPERTEXT

To be truly useful, a word processing package must contain numerous features that can be easily accessed through a simple, straightforward command structure of logical consistency. If properly organized and implemented, such a structure quickly becomes second nature to the user, thereby reducing learning time, time spent completing tasks, and frustration.

Muse's Supertext Professional Word Processor is such a package. It contains two

program disks, an excellent wire bound manual, and a separate quick reference foldout.

Users are taken every step of the way with clearcut, concise instructions. The on-screen menus are faithfully reproduced in the manual, so there is never a question as to what the screen looks like if the program isn't booted.

One of the prime advantages of SuperText over most other 64 word processors is that it generates a legible 80 column screen on a 1702 monitor without additional hardware. While using this option, screen layout can be made to appear as it will print, thereby eliminating the need to preview video output before the hardcopy is produced. WYSIWYG (What you see is what you get!) is an incredible time saver. It also cuts down on the cost of paper.

For those users with a TV hookup or a lo-res monitor, there is a default 40 column video output.

The introductory chapter provides a nice tutorial on how to load the program, create, save, delete and load files. It also touches upon the Help screen available in the 80 column mode and lists the command keys.

The next two chapters fill out the information on file handling by covering previously mentioned items in greater detail. File merge, use of the on-screen status line, and the means to initialize blank disks are also explained.

The file editing commands and modes are covered thoroughly. Find and replace (word or phrase), cursor control, text scrolling, and the Add and Change writing modes are covered.

Use of block operations for text insertion, deletion, and copying are discussed. Making use of the split screen capabilities is highlighted, as are special options like estimating total number of words, determining the number of occurrences of specific words or phrases, and identifying the last three changes made to the text.

Methods of format control are explained in two chapters. The first explains how commands can be sent for each line of text (showing only on-screen). The other illustrates how to change the layout settings, the printer

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continued...

specifications, background and text color combinations, and other control functions by altering the default parameters for each.

Such a two-pronged system is also used for autolinking separate documents, setting the type of paper used, entering control key sequences, and accessing special printer capabilities such as boldface and underlining. SuperText can handle whatever the hardware supports as it boasts numerous pre-set default options, any of which can be altered to custom fit a printer not normally linked to a 64.

The flexibility of this program, coupled with its wide range of features and ease of use make it a pretty near perfect package. In under 90 minutes I was able to put SuperText through its paces, using it with a good deal of confidence for the last 30 minutes.

Besides the expected features such as word wrap, SuperText provides a way to effortlessly recover files lost due to accidental reset, move the cursor to the center of a sentence or the screen, save blocks of text as different files, and perform a line ditto with just two keystrokes.

Actually, most of the inputted commands are done with two entries, though a few require three. The extra stroke, due to the abundance of features offered, isn't detrimental (timewise) in controlling the program.

Almost every command can be entered in two different ways because the function, CTRL and Commodore logo keys are used solo, or in unison with others. This choice of inputs allows computerists to use whatever format they feel most comfortable with.

Unlike some other wordprocessors for the 64, SuperText accesses the disk quickly. There are no long waits while the computer hunts down the desired data. The most feature-laden program is virtually worthless if its speed isn't up to snuff!

I would need a book (the same size as the manual actually) to provide a complete description of the incredible power and versatility designed into SuperText. Even though it has been around for some time, Muse's SuperText is worth investigating.

PAPERCLIP

PaperClip has been an excellent Commodore 64 word processor since its inception. Now, in its latest release, Batteries Included has made it near unbeatable.

Adhering to a corporate policy of continual product improvement, Batteries Included has beefed up, expanded, and otherwise improved PaperClip so that it wears the professional word processor title even more regally than before.

To begin with, the typeset, paperback user's manual is a well organized treasure trove, weighing in at 127 pages. It comes replete with an extensively cross referenced alphabetical index, more appendices than I care to think about, and an easy to use Table of Contents.

Sample exercises and command input practice sessions are too numerous to describe in detail. Since the program is command driven, there are no menus to depict.

```
form letter
Paperclip64* L= 22 C= 1
✓CM:form letter+
✓lm03:rm45+
✓pp66:pg50+
✓jul+
July 26, 1983+
Dear =,+
Our records show that the amount overdue
on your account is $=. Please submit
this amount in order to keep your valued
account in good order.+
If this amount has been paid then disre+
ard this notice.+
Sincerely,+
Alicia DeSoto+
✓CM:Data is in 'data file'+
```

Likewise there's little point in displaying sample screens.

The appendices cover everything from command, error message and directive summaries to installation procedures, work disk duplication and the plethora of printer files (72!) resident on the disk.

What the manual doesn't have is a glossary, a pullout reference card, a keyboard overlay or tabbed sections for fast and easy information retrieval.

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continued...

Document size is memory dependent, a little over 400 lines (at 40 characters per line) resulted in a memory full statement. At that point I merely inserted one of several link document commands and continued undaunted.

The PaperClip disk is not copy protected. On the contrary, BI urges you to make working copies. To protect their property, Batteries Included made PaperClip so it will only work with the supplied security dongle. This 9 pin plastic key must be inserted in joyport number 1 for the program to load or function.

Like most Commodore 64 programs, on-line HELP screens are not in the scheme of things. Of course, the manual does such an excellent job explaining the command structure and otherwise indoctrinating novices, that HELP screens really aren't needed.

Evidence of the program's sophistication also comes to light when you consider that it works with several Commodore 64 compatible 80 column (hardware) display devices and IEEE interfaces. Instructions are even included for channelling printer output through the user port to serial or parallel printers.

Even though PaperClip normally displays but 40 columns, there is an 80 column preview mode accessible without additional hardware. However, you will need a monitor capable of handling the resolution requirements. A standard television set won't turn the trick, but the Commodore 1702 will, barely!

PaperClip sports advanced columnar, numeric, arithmetic (field oriented addition and subtraction) and sort capabilities the likes of which are rarely included in any word processor.

If your printer is capable of specialized output (boldface, superscripting, etc.), PaperClip can support it with one of the many drivers. Allowance has been made for highly unique printers in that you can create a customized driver by following the instructions in one of the appendices. No stone has been left unturned!

Besides the aforementioned capabilities, PC also sports advanced cursor control. Tabbing, top of screen, top of document, and end of

document are supported in addition to the standard arrow (cursor) key movements. There's even a high speed scrolling command.

Besides single or multiple character deletion and insertion, the program can transfer, copy, delete or erase ranges of text. Designated ranges can also be saved to a specific file for later use. Word wrap is standard issue.

Nonprinting comments can be included in documents, all margins can be altered at will. PaperClip allows you to force next page, set headers and footers, create automatic Tables of Contents, center text, indent, justify and set right alignment.

Furthermore it makes it easy for you to set page and text length, offset printed output, alter pitch and line spacing, issue printer control commands, and establish soft hyphenation.

Direct disk drive access is possible with the mnemonically based command input structure. For example, CTRL L loads the designated document from disk, CTRL S saves it.

For convenience (and user comfort) it is possible to alter character, background and border colors independently. Speaking of characters, you can even download (from the program disk) multilingual character sets. Parlez vous Francais?

PaperClip handles form letters and data transfer (with The Consultant database from BI) with aplomb. It is equally adept at creating and manipulating columns. In particular you can set the decimal point, replicate, move, delete or erase columns. A well rounded word processor indeed.

Full search, hunt and replace features are part and parcel of the program. Search strings can be matched to any character, at the beginning or end of a word and more. You can even recall the previous search string!

Two other nice features are the ability to predesignate oft-used phrases with a single character, and setting the case (upper or lower) for a phrase.

The built-in SpellChecker, which accesses the separate dictionary disk, allows users to skip potentially troublesome words, ignore, replace, or add them to the dictionary for future reference. The checker works rapidly with little or no tendency to err.

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continued...

PaperClip rates highly in both the ease of learning and the ease of use categories. Its rating climbs to excellent for performance, versatility and error handling.

PaperClip's strengths are legion. Just reread the prior paragraphs. As for weaknesses, the dongle is the major problem. I had one die in the line of duty while working with an earlier version of PaperClip. Words cannot express my feelings about this occurrence.

Despite this difficulty, the new release performed so well, even coaxing underlines, super- and subscripts, etc., from my 1526, that it has become my Commodore 64 word processor of choice. This review was written with it, and it is the wordprocessor with which we edit INFO.

CUT & PASTE

Cut & Paste, the word processor from Electronic Arts, is targeted more to home and educational uses than the business market. Stressing functional simplicity, C & P is not a heavyweight. This is not as much a drawback as it first seems, for the program works well in the market it was intended to serve.

I originally viewed C & P in a less than flattering light. My attitude changed once the editor of another magazine requested I submit my reviews on it (in lieu of MacWrite). After a mere three sessions I was enjoying the program's surprising versatility and ease of use.

A specially formatted blank disk is a must as Cut & Paste stores documents in a proprietary file format. EA includes a preformatted document disk with templates for creation of painlessly quick resumes, letters, envelopes, memos and more.

The 14 page user's manual is written for the Apple version of the program; a separate command card provides the Commodore 64 specific information. Printed on both sides, this card also displays the menu structure, an explanation of each function, and a brief tutorial on the command keys.

Available menu options are displayed on a status line situated at the bottom of the screen. Pressing the LEFT ARROW key deactivates the writing mode, activating the status line simultaneously. The reverse video

highlight can then be moved via cursor key to the desired option. Hitting the RETURN key activates the selected option.

With C & P you can cut and paste or delete single characters or entire ranges of text. Likewise you can move the cursor one character or one screen of text at a time; or to the start or end of a document with one or two keystrokes.

Hard copy output is done through three preset page layouts. All formatting is done after the text has been entered and edited. You can adjust the default page format settings on a temporary or a permanent basis. Just save the settings to disk if they strike your fancy. The only drawback is lack of a preview option.

Cut & Paste is bulletproof. None of my error-causing, program-crashing tricks had any effect. All I got were self explanatory error messages. EA took all the fun out of it!

The most sophisticated feature in the entire program has to be elimination of widows and orphans, those single lines of text which print out separately from the rest of a paragraph.

If you're in the market for a basic word processor that's easy to learn and operate, Cut & Paste deserves looking into.

WORD COMMANDER 64

Word Commander 64 from MMG Micro Software is billed as the most powerful, easiest to use word processor for the Commodore 64. Don't you believe it.

Though MMG clearly has good intentions, their programming and marketing skills are nowhere near good enough to make that claim, even in jest.

Despite extremely versatile cursor movement capabilities and a logical division of functions between the Commodore logo key and the CTRL key, Word Commander fails to deliver the goods.

Ranges for moving, copying and deleting text have to be defined by on-screen characters known as delimiters. Once the beginning and end of a range is specified, you can invoke the desired action. This procedure is a cumbersome antique leftover from the early days of computing. Absolutely too many keystrokes are needed to get the job done. So much for the easiest to use.

C64 WORDPROCESSORS

continued...

I've worked with dozens of word processors on machines ranging from the 64 to the Mac to the IBM PC, and in all those instances I have never run across such a confused, user unfriendly printer driver. The special typeface control codes (boldface, underline, etc.) have to be entered into a table in hex. Not ASCII, but hex notation. While this is fine for some, others will be completely lost. (Some people I know can't even load the ASCII codes).

The manual is poorly organized and written, making it quite inadequate. The quick reference card has to be torn from the plastic binding to be truly useful.

As for the most powerful word processor, there are at least a dozen other programs reviewed here with as many or more features. Pass this one by.

THE WHOLE BIT

The Whole Bit from Applied Technologies, Inc. is a "me too" product with nothing special to recommend it. Version 2.0, the release tested, comes packaged in a full sized 3 ring binder. The approach may be suitable for the educational market, but it does not work well in the commercial arena.

I'm not saying that the packaging makes the product inferior, it just illustrates the general problem throughout the program. Sometimes you can tell software by its cover.

Like some of the competition, The Whole Bit allows users the luxury of changing text and background colors. Unlike the others, the full range of 64 colors cannot be accessed. Black on gray, white on gray, or white on black, those are the only permissible color schemes. Why do it at all if you can't do it right?

The Help screens are mere duplications of the text in the user's manual. The program does not reformat edited text automatically. You must issue a command to readjust heavily edited material. Unless you're extremely careful, the text can quickly become more misaligned than before the reformat commands were issued.

Even the 80 column preview mode is halfhearted. Layout is displayed, but

highlighted, underlined or boldfaced text, etc., is not portrayed. Granted, most monitors don't have the resolution to display these fine points, but other programs get around this by displaying special text in different colors.

I had trouble getting the cut and paste function to work correctly in all cases. Trying to relocate text to certain areas was impossible. A laudable attempt to create a sophisticated locate/search/insert and replace capability also went awry. Too many suboptions are available from within the same main option. The on-screen prompts are confusing; the user manual is no better. It appears as if the concept was not tested thoroughly enough.

A thoroughly upgraded release is needed to fix The Whole Bit's many faults. An uneven user interface (icons interspersed with prompts), extremely muddled instructions, and half baked features combine to make this program almost completely useless.

KWIK-WRITE!

Kwik-Write! by Datamost falls into the entry level word processing category despite the program's full-featured hype. Actually, the list price of \$19.95 makes Kwik-Write! an exceptional value. The few things it doesn't offer can, for the most part, be gotten around.

Part of the Kwik series, Kwik-Write! loads extremely fast, thanks to the Kwik-Load! boot routine. In addition to this speedy startup, sequential files are loaded and saved around 300% faster than normal file operations as performed by Commodore DOS.

The mini-DOS routine allows you to scratch or rename files, format disks (again faster than under standard DOS), and verify saves. An open window to the balance of DOS is not possible.

Cursor column position is identified on-screen in the edit mode while the line position is displayed in the pre-print preview mode. The amount of character memory is on-screen while writing or editing.

The program manipulates top and bottom margins, centers text, creates footers and headers, merges text, underlines, justifies text and sets line spacing. Furthermore, it allows

C64 WORDPROCESSORS

continued...

you to send specialized printer control commands, pause for ribbon/wheel changes, interface with the Kwik-File! database and save or store portions of text for easy boilerplating.

Additionally you can cut and paste blocks of text, perform search and replace operations, perform global search and replace or alter text, background and border colors.

A joystick can be used to supplement the wide range of keyboard controlled cursor movements. (Just to let you know, the (COMMODORE S) and (COMMODORE D) functions are reversed in one of the manual's tables.)

There's even a form of Table of Contents/Indices/Appendices generation available. Though not fully automatic, it is better than what's offered in most other packages.

Three HELP screens can be called up at anytime. I doubt you will really need them as the functions are not only straightforward, but also they are well explained in the manual.

Error messages are either self explanatory or numbered according to the Commodore 1541 manual. Data can be saved to disk in sequential, program or user formats. You can even display the ASCII code for any on-screen character.

Speaking of characters, Kwik-Write! comes equipped with four alternate character sets. You choose the one you want when loading the program.

By now you're wondering what's not included. A tab function, that's what! Otherwise, Kwik-Write! is a powerhouse for pennies.

Add the functionality of the separate \$19.95 spell checker, aptly titled Kwik-Spell!, with a 30,000+ dictionary and you have a low cost combination that's hard to beat. The checker works with other word processors if they store data according to Commodore specifications. Special formats, as used in Electronic Arts' Cut & Paste, aren't compatible.

You can print the unknown/incorrect words or correct them as the program uncovers them.

Kwik-Spell! helps by offering two possible correct answers from its dictionary. Just press

C to continue, L to add the word to the disk (approximately 5,000 words can be added), or P to print.

KS! waits for you to respond to each suspect word. This may not seem like a problem, but it means that the drive operates non-stop while the entire document is being spellchecked.

The other problem with the spell checker is that the 64 must be rebooted to load it. An option to load it from within Kwik-Write! is sorely needed.

TOTL.TEXT

```
$$ti Sample Textfile $$ $m 10 $rm 10
$$rj $stb 45 TOTL Software $snl $stb 45
1983 $ssk Dear TOTL.TEXT User: $ssk $-
You have successfully LOADED and RUN TO
TL.TEXT and are now examining a textfile
. The first step in using your computer
as a word proce
```

```
input/edit 2 19822
ssor is now complete. $spr So far, you
have started the program (LOAD and RUN),
chosen Input and Output options, and op
ened a file to look at its contents. (LOA
D TEXT). TOTL.TEXT has been written to a
flow ease of user control. Other parts o
f the program extend
xecute in a way similar to this beginnin
g. $spr If you want to practice editing
before closing this file, you can correc
t the mixtaste in this sentence. Or, you
can use the editing features to alpha
betize this short list: $ssk $sin 5 high
- terk $snl yx
```

TOTL Software, one of the original Commodore third party software houses, recently ceased operations. As with most orphaned software, there are still numerous copies on dealers' shelves throughout the land. Their TOTL.TEXT 2.6 and TOTL.SPELLER 3.6 are reviewed here for that reason alone.

Both of these programs had been revised and upgraded regularly. Usually new features were added, though a lack of speed quickly became the main drawback. Written in BASIC, response time made the proverbial turtle look like an Indy racer. The addition of Chickspeed to these offerings was an attempt to push them into the modern age of machine and assembly language software.

This attempt to restore competitiveness was not wholly successful as the cure was not universally applied. Only certain aspects of the programs were enhanced with Chickspeed, low level program patches which speeded up input/output operations.

C64 WORDPROCESSORS

continued...

Though the list of features appears impressive, most of them execute slowly. The text area is split into small blocks which make editing and formatting very cumbersome. Once an area is filled, the next one appears. You have no control over the size of these fields.

Without beating the issue to death, TOTL.TEXT and TOTL.SPELL should be avoided at all costs. Let them go where they belong, a one way trip to the elephant's graveyard.

HOMETEXT

```
This is          from Batteries.
Included. As you can see, it
supports word wrap, and has its own
character set.
It is menu-driven and is pretty easy
to follow, though it is not a
heavy-duty wordprocessing program.
God Bless America.
Now is the time for all good men to
come to the aid of their party.
abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ !"#$%&'()

```

```
Press F51 for Functions menu
Click Buffer left: 13115
Replace Print
```

HomeText, our next stop on the word processing tour bus, is part of Batteries Included's Homepak. This program, along with Cut & Paste, Kwik-Writel, and Creative Writer, form the Bantamweight class of Commodore 64 word processors.

Like Cut & Paste, HomeText stores its files in a special format. Unlike C & P, the program includes a routine which transfers these files to standard ASCII or PET ASCII. This translator also lets you convert other files to HomeText format for manipulation and editing.

Default text, background and border colors can be changed and saved to disk. Printer drivers and the audible key feedback can also be altered. Default text format settings can be changed on the fly through imbedded printer commands.

The program offers 9 cursor movement functions beyond the dedicated cursor keys. Basic tab, insert and delete functions are also supported. A 2 page, wirebound (tsk, tsk!) Quick Reference Guide lays out all the keys and their respective functions. Users familiar with other word processors won't even have to read the user's manual, the Quick Guide should be sufficient.

Since HomePak includes a simple database program, you'd expect a merge file capability. Well, Batteries Included is not one to disappoint. Easy to use, the close relationship between the different functions is a definite plus.

Other standard features include block manipulations like copy, move and delete. Search and replace is supported, headers and footers can be set.

Printer commands (boldface, extended, margin settings), like block manipulation and other functions, are accessed through pop-up windows which appear mid-screen. Just selecting the highlighted letter activates each command. For example, pressing C activates the center text command. This command structure is fast, efficient, and darn near foolproof. (It even works for me!)

HomeText has a small (14K) buffer, being able to store just under 7 pages in memory. The preview feature does not display formatted text, instead it substitutes lines. While this is not ideal, it serves the purpose (with a little practice).

Since I'm griping, the program doesn't highlight blocked text. If you're as forgetful as me, this could be a problem when setting ranges for block manipulations.

There you have it, a quick rundown on HomeText, an adequate home and educational word processor that can also handle light, limited small business duty in a clinch. Recommended.



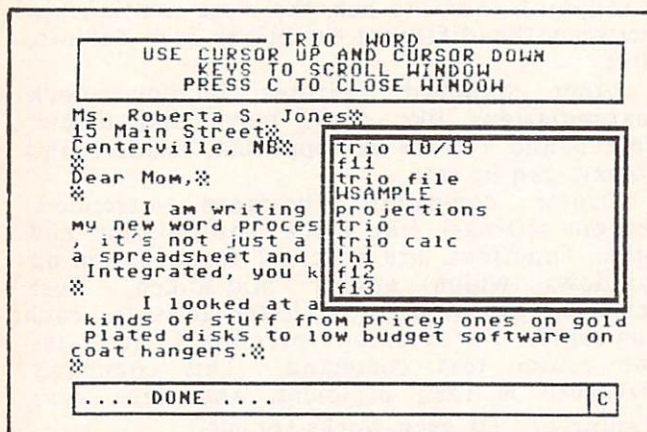
C64 WORDPROCESSORS

continued...

TRIO WORD

Trio, an integrated package from Softsync, includes Trio Word, a curious mixture of advanced capabilities with minor oversights.

Some of its major features include context sensitive, scrolling HELP screens, windows, global (accessing all disk files) search and replace and complete acceptance of all Commodore DOS commands from within the program.



A warm system start is available, but the absolute best feature is the clipboard. By accessing this function you can assign multi-line phrases to each letter of the alphabet. Back in the text area you merely type CTRL-V (LETTER OF THE ALPHABET), and wham!, the phrase is automatically inserted where designated. Providing great flexibility, this powerful feature makes boilerplating completely painless.

The maximum size of a document is 400 lines, though this limit can be circumvented by linking documents. Cursor movement is both easy and diverse. The SAVE command permits range saves, save an entire document, or save to cursor. This level of sophistication is rarely seen on integrated Commodore 64 products.

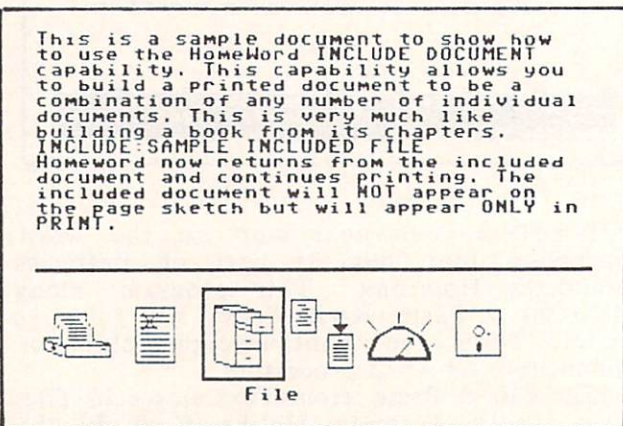
In addition to the global capabilities, Trio Word allows local (memory resident) search and replace. Header, justification, tab set and tab clear are all present and accounted for.

The define a range function is line oriented; that is, it does not allow ranges to start or end anywhere but the beginning or end of a line. This is certainly not the way to go.

There are typos in the otherwise excellent (and comprehensive) user's manual. One example relates to CTRL-X and CTRL-K; the functions are explained in reverse order. This mixup isn't devastating as it concerns the clear tab function.

Softsync has done an admirable job with this word processing module. Additional updates should be forthcoming to provide better utility and to overcome some of the minor shortcomings, such as the lack of a footer capability. To some people this is unforgivable, to others it doesn't matter. Nevertheless, Trio contains a sophisticated, easy to use word processor that's worth the price of the entire package.

HOMEWORD



Homeword, by Sierra On-Line, is one of the best selling, low-end (under \$150.00) word processors ever to hit the home market. Available for some time now, the program earned a reputation for being kind to novices, both the computer and the word processing types.

C64 WORDPROCESSORS

continued...

Unfortunately, this gradual learning curve meant for slow operation, mainly due to heavy disk access. For the longest time I considered this an inferior program. Reviewing it again changed my mind. After several more sessions with it, Homeword convinced me of its utility and cost effectiveness.

The package comes complete with the usual user's manual, program disk, and reference card. However, it also includes a cassette based tutorial. A written transcript is also provided if you do not have an audio cassette player. The beginner's orientation is quite obvious.

The big lure to Homeword is its extensive use of icons to access all the program's features and functions. Within each icon structure command keys are used to activate specific commands. For example, COMMODORE (logo) F performs the find operation within the Edit icon, COMMODORE G retrieves (gets) documents from within the File icon, and COMMODORE L left justifies text when the Layout icon has been chosen.

One level lower, the SHIFT and CTRL keys are used in conjunction with other keys to move the cursor about. The cursor can be moved a single character, a single line, a screen, or a page at a time, forwards or backwards. These are just some of the ways to move it.

The number of printer drivers, as well as the disk commands, need to be enhanced. As it stands now, you must develop a customized printer driver if you do not have a 1525 or work-alike. DOS commands are not allowed from within Homeword. Instead you can list a directory, format a data disk or erase files. More, give us more!

Homeword is easy to use from the very beginning. As time progresses, and you become more familiar with it, the icon access paths will slow you down. At that time it is advisable to switch to the COMMODORE and CTRL keys for faster response times.

In addition to the on-screen status line, the screen displays a small window illustrating the document's layout. Naturally this in-progress preview does not depict the words themselves,

but lines which substitute for the text. You eventually get used to having document text show only on the upper two-thirds of the screen.

Advanced features like complete header/footer capabilities, HELP screens, ASCII character display and insertion put Homeword in the upper range of the middleweight 64 word processors.

Support from Sierra, particularly in the form of an expanded line of Homeword compatible products, ensures the continued viability of the program.

Ted Salamone's definitive look at Commodore 64 wordprocessors continues in the next issue of INFO.



28. NATHAN MINTZ

"I can't imagine why anyone would want a mackerel assembler."



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NOT AS HANDY- TAPING THEM TO YOUR MONITOR). INSTRUCTIONS: CAREFULLY REMOVE CENTERFOLD FROM STAPLES, CUT ALONG COLORED BORDERS, POSITION IN ERGBOARD REFERENCE WINDOW, USING THE ORIGINAL CARDS FOR SUPPORT (OR TAPE 'EM TO YOUR MONITOR). USE THE BLANK BACKSIDES FOR MAKING YOUR OWN REFERENCE CARDS. KEEP SENDING YOUR SUGGESTIONS FOR ERG-CARDS YOU'D LIKE TO SEE. -THE EDITOR.



ERG-CARD™ FOR USE WITH

AmigaDOS™

™ Commodore-Amiga Inc.

CLI EDITING KEYS

CONTROL/:

C Break

G Bell (Video Flash)

H Backspace (Delete)

I Tab to Stop

J Newline

L Clear Window

M RETURN

N Alternate Lock

O Unlock Alternate

ESC ESCAPE

X Delete Line

End Sequence

Strings with spaces must use quotation marks.

name = disk:dir/file or dfn:dir/file

dfn: = df0:,df1:,dh0:,etc. n = integer

AmigaDOS commands are in the :c directory.

Redirect FIRST! e.g. ECHO > PRT: "Hi"

SAY by itself will give you a menu of options.

CONTROL/L-AMIGA/R-AMIGA Reboot

ESC then C to Reset Window

CONTROL/D Break Batchfile

Space (Go to CLI direct)

Backspace Interrupt Scroll

L-AMIGA/N Resume Scroll

L-AMIGA/M Display Workbench

Hide Workbench

DEVICES:

CON: Screen Window

DF0: Internal Floppy

DF1: First External Floppy

DH0: First Hard Drive

NIL: Throwaway/"Bit Bucket"

PAR: Parallel Port

PRT: Preferred Printer

RAW: Window w/o buffering

RAM: Ramdisk

SER: Serial Port

volume: Disk Reference By Name

* Current Window

C: Command Library

DEVS: Device Drivers

FONTs: Font Library

L: Library Directory

LIBS: System Libraries

S: Sequence Library

SYS: System Root Directory

T: Temporary Files

WILDCARDS:

? Match Char

% Match Null Char

n#<pat> Match n Repeats

<pat1> <pat2> Match Both

<pat1> | <pat2> Match Either

() Match Group

#? Match Remainder

' Match Special Char (eg: '?' matches ?)

SINGLE DRIVE FILE COPY:

COPY volume:file TO volume:file

Simulate an immediate mode batchfile by ending lines with CTRL/J, end with RETURN.

Create an immediate mode typewriter with COPY * TO PRT: [TO filename]. End with CTRL\

ASSIGN device,dirname Assign Device

BREAK task# C D E F ALL Send CTRL Chars To Tasks

CD dirname Change Directory/Drive

COPY name TO name ALL Copy File ALL/Subdir.

DATE 01-JAN-86 15:32:45 Set/Read Date & Time

DELETE name name ALL Delete Files ALL/Subdir.

DIR name OPT A I Directory ALL/Interactive

DISKCOPY dfn: TO dfn: Full Disk Copy

ECHO string Display String

ED name Screen Editor

EDIT name TO name Line Editor

ENDCLI Close CLI Window

EXECUTE name Execute Batchfile

***FAILAT** n Fails If Error#>=n

FAULT n Display Error Message #n

FILENOTE name COMMENT message Add Comment To Filename

FORMAT DRIVE dfn: NAME diskname Format Disk As diskname

***IF/ENDIF** IF Conditional

INFO Display Disk Information

INSTALL dfn: Make Disk Bootable As CLI

JOIN name name name AS name Concatenate Files

***LAB** labelname Label Line

Only most used options listed; check AmigaDOS manual for others.

A "?" after commands prompts for input. (e.g. DATE ?)

LIST name P pattern List File Information

LOADWB Load WorkBench

MAKEDIR dirname Make Subdirectory

NEWCLI CON:x/y/w/h/name Open New CLI Window

PROMPT string Prompt=string (%n=Task#)

PROTECT name rwd Change Protection Status

***QUIT** n Quit Execution

RELABEL drive# diskname Rename Disk

RENAME name AS name Rename File Or Subdir.

RUN name/command Run Concurrent

SAY -m/f -r/n -s# -p# string Speak String (No Quotes)

SEARCH dirname string ALL Search Files For string

***SKIP** labelname Skip To Label

SORT name TO name COLSTART n Sort Textfile On Column n

STACK n Set Stack Size

STATUS n FULL Display Task Status

TYPE name TO dev: OPT h Type Textfile/Hexadecimal

WAIT n/UNTIL HH:MM Wait n Secs/UNTIL HH:MM

WHY Display Reason Failure

name Run Singly

< > Redirect Input/Output

***** string Comment

Many commands SET parameters or DISPLAY settings if alone.

*=Batchfile command not available in immediate mode.

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Navigation

J INTER-SPACE JUMP

C DOCKING COMPUTER ON

P DOCKING COMPUTER OFF

F FIND PLANET

H HYPERSPACE JUMP

CTRL H INTERGALACTIC JUMP

D DISTANCE TO SYSTEM

O CURSOR HOME

↕ CURSOR CONTROL

Other Controls

ⓐ SAVE GAME (DOCKED)

A KEYBOARD RECENTERING TOGGLE

R/S KEYBOARD DAMPING TOGGLE

K KEYBOARD/JOYSTICK TOGGLE

Y JOYSTICK Y AXIS REVERSE

J JOYSTICK REVERSE

M DOCKING MUSIC ON/OFF

Q SOUND EFFECTS OFF

S SOUND EFFECTS ON

F INDICATOR FLASH TOGGLE

P PLANET SURFACE LINES

← START NEW GAME

Buy Cargo Sell Cargo Equip Ship Galaxy Chart Local Chart System Data Market Prices Status Screen Inventory

← 1 2 3 4 5 6 7 8 9

Escape Pod ECM E T U Unarm Missile

Laser A S Dive Target Missile Fire Missile Roll

Energy Bomb X Climb M < > / Slow

Thrust

Resume Freeze

Launch

F1 Front View

F3 Back View

F5 Left View

F7 Right View

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FORMAT LINE:

SYMBOL:	KEY:	ACTION:
>	TAB	SET TAB STOP
>	SPACE	SET LEFT MARGIN
<	SPACE	SET RIGHT MARGIN
	CTRL/N	COLUMN SET
1,2,3	1,2,3	LINE SPACING (COLUMN 2)
S	S	SPLIT PARAGRAPHS (COLUMN 2)
P	P	DO NOT SPLIT (COLUMN 2)
T	T	FORCED PAGE (COLUMN 2)
RVS/##,X	C/##,X	ASSIGN SEQUENCE

LETTERS OR NUMBERS.

IF LETTER IS FIRST, ESC IS AUTOMATICALLY SENT.

FUNCTION KEYS:

F1	PAGE FORWARD
F2	PAGE BACK
F3	NEXT SCREEN
F4	PREVIOUS SCREEN
F5	NEXT TAB
F6	MOVE TO OTHER END OF LINE
F7	INSERT TEXT
F8	DELETE TEXT
ALT/CRSR-LEFT	LEFT ONE COLUMN
ALT/CRSR-RIGHT	RIGHT ONE COLUMN
ALT/A-Z	INSERT GLOSSARY ITEM
ALT/LINEFEED	SCREEN DUMP
SHIFT/CLR	GOTO END OF PAGE
HOME	GOTO TOP OF SCREEN
HOME-HOME	GOTO TOP OF PAGE
RUN/STOP	END INSERT & ABORT PRINT
SHIFT/RETURN	GOTO START OF NEXT LINE
SPACE	INTERRUPT PRINTING

CONTROL KEYS:

C	CENTER LINE
E	EMBOLDEN
F	COPY LAST FORMAT LINE
H	HIDE FORMAT
I	INDENT PARAGRAPH
N	COLUMN FORMAT
P	END OF PAGE
R	RIGHT ALIGN LINE
T	TAB (OR USE TAB KEY)
U	UNDERLINE
-	NUMERIC TAB
.	SOFT HYPHEN
SHIFT/SPACE	HARD SPACE
L	LITTLE (CONDENSED) PRINT
O	OFFSET (SHADOW) PRINT
W	TOGGLE/WIDE(ENLARGED) PRINT
S	SUBSCRIPT NEXT CHAR
*	SUPERSCRIP NEXT CHAR
#	PRINT PAGE #
0-9	SEND ASSIGNED CODE SEQUENCE
M	MERGE
D	DON'T MERGE

CALCULATOR:

=	DISPLAY RESULT
C	CLEAR ENTRY
CLR	CLEAR ALL
M CLR	CLEAR MEMORY
M =	MEMORY RECALL
M +/-	MEMORY MATH FUNCTION
?	SELECT OPTIONS
R	READ NUMBER FROM DOCUMENT
W	WRITE NUMBER TO DOCUMENT

MENU COMMANDS:

COMMODORE KEY ACCESSES MENU BAR

SPACE, CURSOR KEYS MOVE BAR

RETURN SELECTS. OR USE FIRST LETTER OF COMMAND.

COMMAND BOXES:

CRSR TO MOVE, SPACE TO SELECT, RETURN TO END

ERG-CARDSM REFERENCE CARDS

(DO-IT-YOURSELF SIDE)

--

ERG-CARDSM REFERENCE CARDS

(DO-IT-YOURSELF SIDE)

--

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Color Atari 520ST



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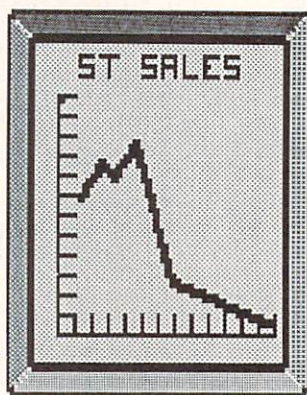
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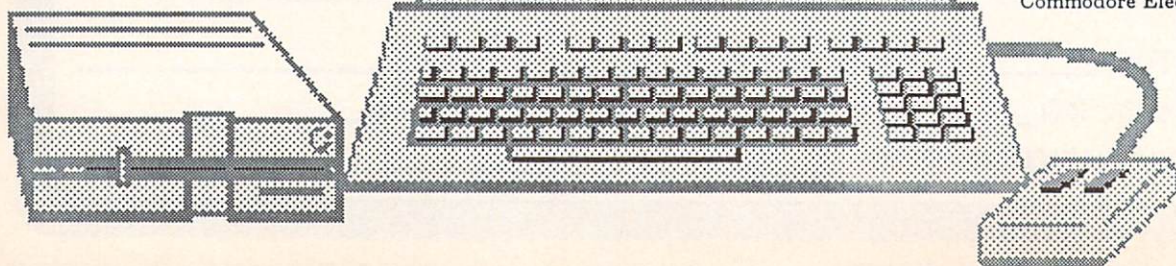


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Fully expandable?	yes	no
Max. RAM expansion	512K	512K
Number of sound voices	3	3
Number of keys	92	94
Number of cursor pads	2	1
Number of joystick ports	2	2
Serial port?	yes	yes
Cassette interface?	yes	no
Disk storage capacity	340K	360K
Uses cheap 5.25 disks?	yes	no
Modes of operation	3	1
Software available	6000+	100-
Runs CP/M+ software?	yes	no
Runs C64 software?	yes	no
Runs Atari 800 software?	no	no
Number of video chips	2	1
Number of displays	2	1
Maximum text display	80x24 (color)	80x24 (mono)
Max. displayable colors	16	16
Max. res. w/16colors	640x200	320x200
Number of video outputs	3	1
Standard RGB monitors?	yes	no
Home TV sets?	yes	no
Composite monitors?	yes	no

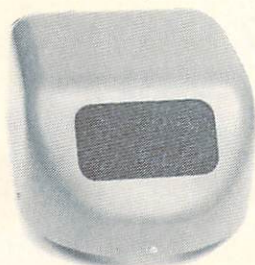


Commodore
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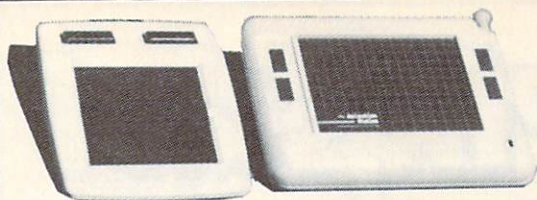
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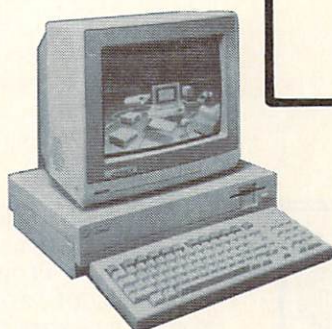
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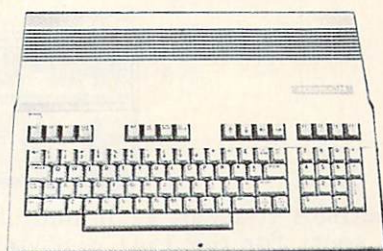
What
is it??



Which one is
best for me??



What's New??



How good
is it??

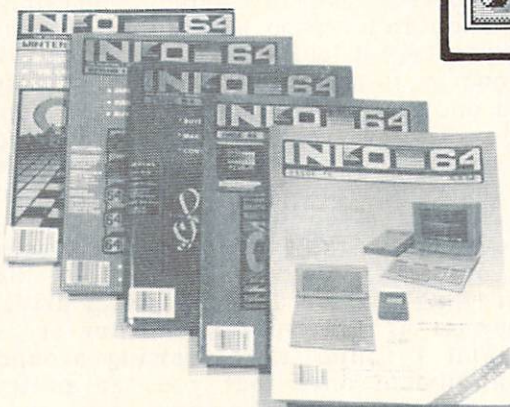


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Physical Exam



Sometimes it seems as if one of the original design specs for the 1541 disk drive must have said "Mean time between failure: 10 accesses." If you have used a 1541 for very long, and especially if you have used very many of the older head-banging copy-protected commercial programs, you are probably getting a lot of read errors by now. Fortunately, the problem is not a permanent one: it is probably caused by the head being knocked out of alignment. Unfortunately, a technician will probably charge you \$35 or more to align your drive again, with no guarantee that the problem won't reoccur. In fact, it most likely will recur after another year or so of normal use. So what is your alternative??

The best thing you can do if you know how to hold a screwdriver is to buy **1541 Physical Exam** and do the alignment yourself. For \$39.95 you get a precision-calibrated test diskette, two drive stops (more about them later), and an instruction manual.

The first thing you do is to run the test program on the diskette to see if alignment is truly your problem. You'll get a bare-bones display which indicates whether or not your drive is reading within the specifications it should. You'll also see if the speed adjustment is correct, and whether your head stop is checking okay.

If your drive is out of alignment, you'll have to take it apart and follow the step-by-step instructions on how to align your drive. Alignment turns out to be a pretty simple process once you've pulled your drive completely apart, involving loosening two drive mounting screws and twisting the drive motor from side to side until the screen display shows your test within bounds. When you've got it under control, you just tighten things up, reassemble the drive, and dump a copy of the test screen to your printer for a reference the next time you have to align your drive.

The disk is a really remarkable piece of work, with finely calibrated tracks up and down its breadth to determine alignment accurately from track 1 to track 35 +/- 1/1000th of an inch. The program itself is saved in a sort of wide format to assure that it will load on even the most incredibly misaligned disk drive. I even inadvertently loaded it once with the mounting screws on the

drive motor completely loose!

If you have an older 1541 drive (one with a latch-type door, not the quarter-turn lever) an additional step you can take in the midst of alignment is to replace your hard metal drive stop with a softer spring-steel stop. As mentioned, two are supplied in the **1541 Physical Exam** package. Additional stops for additional drives are available separately, though it shouldn't be too hard to make your own once you take a look at the ones provided.

Putting one in is pretty easy, requiring only taking out one screw, popping out the old stop, popping in the new, replacing the screw, and bending around on the stop a little while checking the stop check readout on the screen. The new stop is much less prone to getting knocked out of whack, and quiets down your drive considerably, too. It is probably the single best thing you can do for an older drive.

The manual is not very slick, but it is accurate, and I found after messing around with an alignment once that you can pretty well dispense with the alignment tool they supply for you to tape on the drive motor, but the disk and the stops supplied with **1541 Exam** are top-notch, and let you perform a delicate task with about as little pain as possible. Cardinal has also now developed versions for Commodore's 8050, 8250, and 4040 drives. If you feel comfortable changing the batteries in your watch, you should be able to handle adjusting your own disk drive with this valuable tool.

1541 PHYSICAL EXAM is \$39.95, from:

Cardinal Software
13646 Jefferson Davis Highway
Woodbridge A 22191
(800) 762-5645



ADA trainer



DOD LANGUAGE IS FOR LEARNING ONLY

The Ada Training Course from Abacus is intended to provide an introduction to programming in Ada, the Department of Defense's new official programming language. Many major mainframe software houses, especially those with extensive government contracts, are busily converting to Ada in order to meet DOD specifications. Eventually, all DOD (and probably other government agency) programs must be written in Ada.

Ada is a very powerful, very full, very complex language. It is impossible to implement it completely on a micro. Even the most complete MS-DOS versions are subsets of the language. The Amiga is the first Commodore computer with the capacity to even begin to meet the requirements of Ada. With this in mind, we can look at Ada on the Commodore 64.

The Ada Training Course provides you with an editor for producing Ada source, a syntax-checker for examining the correctness of your Ada source, and a mini-compiler which will handle a very limited subset of the Ada language. You also get an assembler to assemble the compiled Ada code down into executable machine language, and a disassembler to convert m/l to assembly language. The manual covers operation of all these modules, as well as providing a tutorial on the basics of the Ada language.

It is immediately apparent that the Ada supported by the Ada Training Course is such a small subset of the full language that its utility is questionable. You can't write anything but demo programs with this Ada. Integers, floating point numbers, and strings are all confined to the same ranges as in C64 BASIC. The only conditional supported is IF/ELSE/ENDIF. The only loop is LOOP/EXIT/ENDLOOP.

SAMPLE ABACUS ADA LISTING

```
00010 with TEXT-IO; use TEXT-IO;
00020 with CBM-64 ; use CBM-64;
00030 --
00040 procedure DECISION is
00050 --
00060 --
00070 -- define the test variable.
00080 --
00090 TEST : float;
00100 --
00110 --
00120 begin
00130 --
00140 screen-clr;
00150 --
00160 new-line ( 5 );
00170 --
00180 put-line (OutputPrinter(1)/Screen(2)?);
00190 --
00200 get ( TEST );
00210 --
00220 if TEST=1 then
00230 --
00240 -- Output to the Printer.
00250 --
00260 set-output ( printer );
00270 put-line (Block structures are great!);
00280 set-output ( screen );
00290 --
00300 --
00310 else
00320 --
00330 -- Output to the Screen.
00340 --
00350 put-line ( Block structures are great!);
00360 --
00370 --
00380 end if;
00390 --
00400 end DECISION ;
```

On the other hand, the syntax checker looks for a wider variety of Ada structures and keywords than the compiler does, so it may be possible to write more complex programs, check their syntax, and upload them to a mainframe for compilation. Without access to a more powerful Ada system, it is impossible to judge.

The intentions of this program are admirable, but the limitations of the Commodore 64 system really restrict the Ada Training Course. Though you will gain some familiarity with the elementary aspects of Ada through this course, you will very quickly have to move on to a much more powerful system, and you may have to unlearn some things in the process. If you are really serious about

ADA TRAINER

continued...

Ada on a micro, I strongly suggest moving to an MS-DOS system, or at least to a C128, which should run Janus Ada in CP/M mode. On the other hand, if you own a Commodore 64, are curious about languages, and want the chance to experiment a bit with Ada, the Ada Training Course is the only game in town.

Ada Training Course, \$39.95 from:

Abacus Software
PO Box 7211
Grand Rapids MI 49501

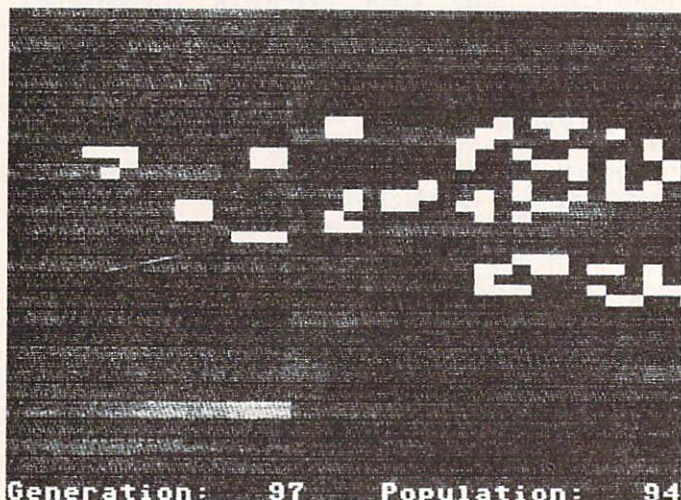


BLAST FROM THE PAST

Back in the Good Old Days, we hackers used to play some great games on our homebrew micros. Star Trek, Life, Adventure, Eliza, Hunt the Wumpus, Numguess, Hurtle, Lunar Lander, and Hangman burnt up most of the early microprocessing time. The reason was simple: they would all fit in 8K or less of RAM. It didn't even make sense to talk about writing a wordprocessor or database manager for a micro, because at \$5200 or better for every 8K of expansion RAM, nobody would have been able to afford a machine powerful enough to run them. And anything that required disk storage was out of the question, too. A disk drive cost \$700 or more, and you had to figure out how to interface it yourself. We considered ourselves lucky to have a paper tape reader or a cassette tape player just so we didn't have to key in the hex code on the front panel switches every time we wanted to play a game. Needless to say, 8K was also about at the limits of patience for cassette and paper tape load times.

Of course, the big challenge was writing the most jam-packed, detailed, version of a game and squeezing it into that 8K. The gameplay, though important in judging how good a job you did programming, was really secondary to the programming challenge itself. The result of all this is that you can now find about 800 different versions of each of these games in the public domain for just about every variety of personal computer ever made. If you belong to a users' group you no doubt have access to a club library with at least two or three versions of each for the Commodore 64.

However, for some reason Electronic Arts has decided that they need to bundle some pretty standard versions of Adventure, Eliza, Life, and Pong (I forgot to mention Pong, but we played that, too) into a single-disk package called **Golden Oldies**. I suppose there are people out there who have never seen these programs, but I've got to wonder if there is a real market for them. They are all rather dated by today's standards, and I'm afraid that someone used to Infocom's adventures is going to be disappointed by the original Adventure, just as a Ballblazer fan is going to be less than



thrilled by Pong. Eliza is far outshined by today's Artificial Intelligence programs (like Racter), and Life...well, Life may be the sole exception. There has never really ever been anything else quite like Life. Though it runs faster than the old BASIC programs, this version is not as fast as some pure machine language versions I've seen. The graphics are less than inspiring, too. The lo-res mode uses asterisks on the character screen, and the hi-res mode just uses half-block character graphics. The manual apologizes for the fact that the Commodore 64 version does not have as high a resolution as the Apple version (Apple conversionitis, again!)

GOLDEN OLDIES

continued...

This package could have at least been nice for novices if EA had presented the programs in uncompiled, REMarked BASIC so that they could have been listed and studied. These are pretty good implementations of the old standards, and might have provided some insights for budding programmers. Unfortunately, they are compiled and therefore useless for study. The disk is even copy protected--so heavily protected that it will not even load on a 1571 drive.

If you are really interested in early games for your computer, scan your club library. You will probably find perfectly adequate versions of these four Golden Oldies there.

Golden Oldies is from Electronic Arts

em256K RAM



If you are a hacker, and you're interested in the possibilities that adding a quarter megabyte of expansion RAM to your Commodore 64 would open up to you, read on:

The EM256K from Performance Peripherals adds 256K of RAM to your system for only \$94.00 (including shipping!). Before you set out writing a monster BASIC program to fill up all that space, let's make it clear that this amount of memory can be connected to an 8-bit cpu like the one in your C64 only by using bank-switching techniques. It is not contiguous, and not available all at once. In fact, the EM256K is organized as 64 banks of 8K, which means that 8K is accessible at any one time.

The EM256K currently requires the connection of a cable with three clip leads to the guts of your C64. The installation is simple and requires only a few minutes, though it is not for the inexperienced user. An updated version is under development which will eliminate the cable.

Using the EM256K is relatively simple. A POKE to a control register at hex \$DE00 controls the bankswitching. The RAM is banked in parallel with system RAM at hex \$8000. Interestingly enough, a POKE to expansion RAM is also written to the underlying system RAM, but a PEEK reads only the expansion bank unless the EM256K is deselected by a POKE to the control register.

A utilities disk is currently under development which will allow users to configure the EM256K as a RAMdisk, hide hires graphics screens there, use it for lookup tables and other programming aids and shortcuts, etc., (free to those who purchase ahead of time, but at additional cost later on). Until then, you are on your own. The manual gives some excellent suggestions on how to use the unit for stacked BASIC program storage, how to make RS232 applications compatible, etc. I played with it from BASIC for a couple of nights and had a ball putting dozens of BASIC programs into memory all at once and accessing them with a POKE to the controller.

Normal people aren't going to be able to plug in this 256K RAM expander and run huge spreadsheets, but if you are a hacker or developer with the expertise to wring the capabilities out of this unit it is certainly a bargain at this price.

The EM256K is \$94.00 ppd. from:
Performance Peripherals Inc.
5 Upper Loudon Rd.
Loudonville NY 12211
(518) 436-0485



THE NEWSROOM™ from SPRINGBOARD



Make
your own
News-
letters
on your
C64 !!

Now Anyone Can Write A Newsletter!

With The Newsroom from Springboard Software, anyone can write a newsletter, complete with illustrations, using a Commodore 64 home computer. The program lets you create banner headlines, edit short articles, and create illustrations using clip art or

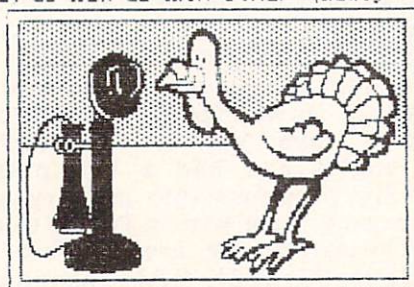


original drawings. The final result is very nice, though you will find it takes a while to do.

Now You Can Talk Turkey!

The Wire Service section of The Newsroom lets you upload and download Newsroom photo, banner, and text files to and from the Apple and IBM off-brand turkey computers, as well as with other quality

computers. If you and a friend both have The Newsroom, you can work together.



Long Disk Accesses May Make You Mad!

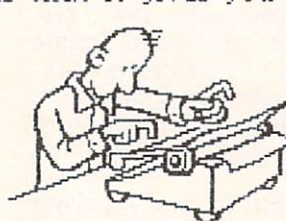
It seems like everything you do with The Newsroom requires a disk swap or at least a lengthy disk

access. The main disk has to be in the drive almost all the time, since even simple menu selections seem to require something from the disk. You also have to swap a data disk and clip art disks in and out. This is, without a doubt, the major flaw in The Newsroom. It makes creating an entire newsletter a long process.



Newsroom Does It All

The major advantage of the Newsroom is that it gives you capabilities you



never had before. Up till now, if you wanted to print a newsletter you had to engage a professional printer or be satisfied with typewriter

style output. The Newsroom gives you a nice, finished looking product using a personal computer for about the same investment as the typewritten version. It gives you a new reason to own a home computer. But I do wish that it justified your text into neat columns. I wish that it worked faster—it can take you a whole afternoon to put out a newsletter. On the other hand, you could not have produced a newsletter this good in just one afternoon before The Newsroom. I wish you had a little more flexibility with fonts. There are only 2 small fonts and 3 big ones. I am glad you can edit and save clip art. But I wish you could type over the borders of pictures if you had to. If you cut your "photo" too big, you have to go back and redo the whole process to fix it. It really takes some getting used to before you are consistently producing the finished panels you had in mind. But my suggestions here are for improvements, not major bug fixes. It works.

High Score For Innovation

INFO RATED
★★★★

The Newsroom is an innovative product, just as The Print Shop was before it. Because of the new capabilities it gives the home computer owner, we've given it a high rating. However, it does suffer from its speed limitations, especially the number of disk accesses required. Small children may not have the patience required by this program. I would also like to see more fonts and graphics tools. I just have to wonder how many of its limitations come from the "Apple Translation-itis" we've seen so often before.

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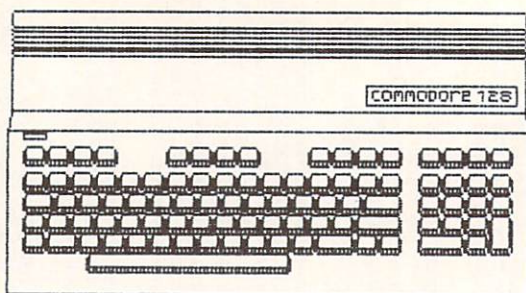
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C128 NOTES



HIRES PICS

The C128 gives you many new capabilities, not the least of which is the ability to work directly with hires graphics. There are probably times when you wish you could combine some of BASIC 7.0's graphics commands with the fine control you get from a drawing program. Well, it is possible to pass hires graphics between the C128's hires screen and Doodle!, the excellent hires drawing program for the C64 from City Software.

To load a Doodle! picture into the hires screen of the C128, use the command: **BLOAD "DDname",P7168**. The BASIC 7.0 command **GRAPHIC 1** will then display it. To save C128 hires screens in Doodle!-compatible format, use: **BSAVE "DDname",P7168 TO P16500**. So now you can create kaleidoscopic patterns using BASIC 7.0 commands and finish up detail work with Doodle!.

CP/M TERMINAL EMULATION

In the CP/M mode the C128 emulates an ADM31 terminal. Page 223 of the C128 manual tells you how the control and editing keys work in that mode. You can use this information if you are having trouble getting a Kaypro II program to look right on the screen. Just look for an **INSTALL** program on your Kaypro disk, run it and set the terminal defaults to ADM31 mode. If you are buying a CP/M program, try to get the Osbourn version first; they have proven most compatible so far. But if you must use a Kaypro version, the **INSTALL** trick will usually get you by.

DIRECT MODE CALCULATOR

If you do a lot of programming, it's mighty handy to use BASIC 7.0 **KEY** commands to set up the function keys for use in conjunction with the numeric keypad as a direct-mode calculator. Try this for a minimum configuration: **KEY1,?:KEY5,*:KEY7,/**. This turns the F1 key into a ? for PRINT, F5 becomes the * for multiplication, and F7 is / for division. To figure a problem, hit F1 first, then key in the problem, and hit ENTER on the keypad. If you make a mistake, reach your index finger over to the DELETE key to fix it.

With this configuration, the F3 key is still free for the default **DIRECTORY** command. You can also add memory functions to the shifted function keys with this additional direct mode BASIC line: **KEY2,M=0:KEY4,M:KEY6,M=M-:KEY8,M=M+**. This makes F2 a Memory Clear function, F4 is Memory Read, F6 is Memory Minus, and F8 becomes Memory Plus. By using your left hand just to shift, the memory is pretty easy to use. You can, of course, also use any keys from the keyboard to supplement your little direct-mode calculator. You can even reprogram the function keys with much-used formulas or as parentheses or whatever else you think might be handier. As long as you have your C128, you'll never be without a calculator again!

FAST 64 MODE

It's relatively easy to kick in the 2MHz clock in C64 mode, but you'll run into a problem with your display. The VIC chip only works at 1 MHz, so if you go to 2 MHz you'll get a garbage screen until you kick back. **POKE 53296,PEEK(53296)OR1** puts you into 2 MHz mode, and **POKE 53296,PEEK(53296)AND254** takes you back. If you don't want to look at the screen gyrating, you can **POKE53265,PEEK(53265)AND239** to blank it. **POKE53265,PEEK(53265)OR16** to get it back when you are done.

ROM CHANGES

The grapevine tells us that the C128 has gone through five ROM revisions to date. Of course, this means that some software and hardware are going to have problems accomodating. For example, **Paperclip 128** has had to be revised for the latest ROMs. There are early copies that will work only on early machines. (Batteries Included will update you if you need it.) The early C128s also had a deficiency in the signals at the cartridge port that kept some of the sneakier cartridges like **ISEPIK** from working. Apparently the latest machines take care of the problem. The result of all this is, of course, that those of us loyal Commodore users who ran right out and got the first C128s are zapped again.

bobsterm pro

by PEGGY HERRINGTON

A new, wonderfully enhanced version of a successful terminal program for the C64 is available: **BobsTerm Pro-128**. Operating in 128 mode displaying 40 or 80-columns of very readable text on a 1701 or 1702 monitor (in black and white, with a choice of six character sets) it has every feature I ever wanted online including overlapping windows and audible reminders. Besides regular Xmodem, it offers CRC, CompuServe B, and Punter protocols (all of which are present in the 64 version, too) and it will format CP/M disks on a 1571 disk drive and transfer CP/M programs.

37 user-programmable function keys to emulate many terminals are provided (you'll need a list of the command sequences) and it comes preset to emulate the most commonly used functions of the VT-100, VT-52 or ADM-31, with scrolling and full-screen editing. The capture buffer holds 60K bytes (28.5K in the 64 version) and you can write and edit messages easily there offline, save them to disk and then transfer them from either source, adjusting the number of characters per line (in 128 version only) for different host systems. An oversized file can be edited in either version by loading and resaving it in sections.

Both versions work from 50 to 2400 baud with all Commodore- and Hayes-compatible modems including the 1660. Although several features (macros and carrier detect) are limited with the 1660 the documentation describes how to modify it for full 1650 compatibility. Entire disks can be transferred from Commodore to Commodore without operator intervention. Different files types can be saved to disk, and conversions like BASIC program to sequential listing (and vice versa), program to ASCII-IMAGE and back, and strip source code comments are easily implemented.

Auto-redial is available in both versions with unlimited phone book storage, log-on strings and programmable macros, and a remote mode that acts as a mini-BBS with file transfers, passwords and a welcome message is available. Split screen entry mode, word wrap, stripping of null characters, display of all program transfers and control characters, ASCII or PETSCII conversions, real-time clock and stopwatch timer, compatibility with the MSD Dual, SFD 1001 drives and Buscard, complete DOS accessibility and programmable

INFO rated



CR:BF=28500:E:LI:LO:C:7:ESC:~:0:00:00

CONKEY MENU

{GA}-ASCII/BINARY
{GB}-BUFFER
{GC}-CAPS LOCK
{GD}-DISPLAY TRANSFERS
{GE}-ECHO
{GF}-SCREEN FORMATTING
{GH}-HOOK TOGGLE
{GI}-LINEFEED IN
{GO}-LINEFEED OUT
{GK}-FUNCTION KEY LIST AND EDIT
{GL}-LINE/CHAR ENTRY MODE (TERM MODE)
{GN}-NULL STRIP (TERM MODE)
{GP}-PRINTER ONLINE (TERM MODE)
{GR}-RESET TIMER
{GS}-SET TIME/START-STOP TIMER
{GT}-TIME/TIMER TOGGLE
{GX}-XFER FILES (TERM MODE)
{GE}-DISPLAY CTRL CHARS
{G*}-CLEAR SCREEN (TERM MODE)

{RUN/STOP}-RETURN TO MAIN MENU

function-key strings round out both versions. Both will correct the Restore key problem on the SX-64 and Reset problem on the 1541 drive, offer access to printer parameters online and off, and are written in machine language for fast operation.

With all these features, you might think **BobsTerm Pro** is complicated to use but its intuitive operation really impresses me. A single status line in terminal mode shows current settings, many of which can be toggled on/off by holding the Commodore key and pressing a letter: open or close the capture buffer with C=/B, toggle echo (duplex) with C=/E, display transfers with C=/D, start transfers with C=/X, press C=/H to hang-up or pick-up the phone. Run/Stop takes you out of terminal mode (without signing off) to save the buffer (or you can download straight to disk if you wish) or change settings such as communication parameters, screen colors, etc.

Both version's ease of use, multitude of features and extensive but highly-readable documentation prompt me to recommend **BobsTerm Pro** without qualification for beginning and power-users alike.

BobsTerm Pro C64 (\$59.95); **BobsTerm Pro-128** (\$79.95)

Progressive Peripherals & Software
2186 South Holly, Suite #2
Denver CO 80222 Phone: 303-759-5713

XPIP



CP/M: XPIP

The CP/M+ operating mode of the C128 is really nice. It gives you a lot of power and access to a great many programs. Unfortunately, it almost overwhelms you with capabilities. Learning to use all the CP/M commands with all of their options could become almost a full-time job, and Commodore's sketchy coverage of CP/M in the C128 manual doesn't help things a whole lot. The HELP files on the CP/M disk are useful, but still require you to learn a lot about the commands before you can actually use them.

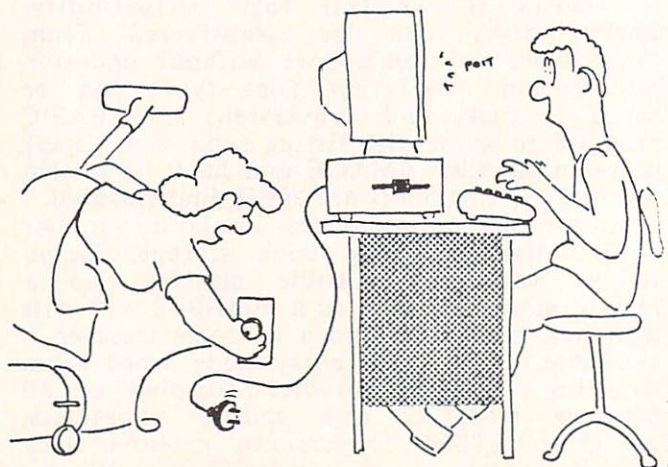
XPIP from System Facilities Inc. was written to help overcome these problems. Though they don't supply a version directly for the C128, the Kaypro II version boots up and executes without flaw. When you insert the disk in your 1571 drive (having first booted the CP/M+ operating system) and ask for a directory, your C128 will ask you if Kaypro IV format is what you want it to read. If you hit the right-cursor key, it will change to say Kaypro II. Hit RETURN and you are in business. When you get your A> prompt back, type XPIP and hit RETURN. You will see your prompt change to an A with a curly bracket. If you type a '?' and RETURN, a menu will come up with nineteen numbered commands. If this is your first session with XPIP and you need some help using it, selecting '18' will bring up help screens covering all of XPIP's functions.

Though this utility is named for CP/M's PIP copy command, it does much more than just copy files. There are also commands to list and change the directory, print files, change file parameters, compare files, search for a string in a file, and even edit tracks and sectors on the disk. Each of these functions has many options, and all are accessible through menus and submenus or simple commands. You can even create batch files of XPIP commands and execute them. Even though CP/M+ offers many of the same functions as XPIP, this program's main utility comes in its menu-driven user friendliness.

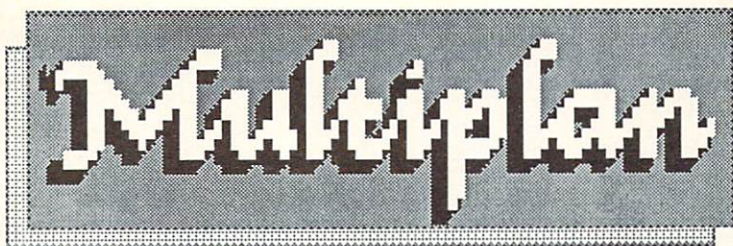
The manual is the only drawback to XPIP. Though it is comprehensive, sometimes it is not very clear. This is because one manual covers both the MS-DOS and CP/M versions of the program, and rather than divide the manual into separate sections, both are covered simultaneously. I found myself sometimes confusing the CP/M and MS-DOS commands. However, if you stick with the HELP files and only refer occasionally to the manual, things are much clearer.

XPIP provides a nice menu-driven environment for the file maintenance commands you'll need to use under CP/M without the pain of learning all the CP/M+ command options. And the built-in disk editor is an absolute must for programmers or others who might want to resuscitate crashed disks. You can live without **XPIP**, but it could make your life easier.

XPIP, \$29.95 from:
System Facilities Inc.
PO Box 7079
Charlottesville VA 22906
(804) 977-5245



"I'll just be a minute, dear."



INFO rated



C128 Version

INFO rated



C64 Version

C128 MICROSOFT MULTIPLAN

Microsoft's excellent Multiplan spreadsheet program is an industry standard. Once available from HES Software for the Commodore 64, Epyx has now obtained the Commodore rights to Multiplan. They ship it with versions for the C64 and C128 on a single disk.

Multiplan loads in C128 mode in either a 40-column or 80-column version, depending on how the 40/80 switch is set. You cannot switch between the two displays once the program is loaded. Of course, the 80-column version is much easier to use than the 40. Because of Epyx's built-in Vorpil Fast Loader, Multiplan is on the screen and ready to go in a manner of seconds. There is no fancy title screen: you are immediately presented with a blank spreadsheet. A function menu is displayed on the bottom few lines of the screen.

OPERATION

You can use the cursor keys to scroll through the menu bar and pick the functions you want to perform, or you can enter the first letter of the command. All selections lead to sub-menus; the process is highly intuitive and self-explanatory. If you encounter something you don't understand, a tap on the HELP key brings up a disk-loaded help screen to explain it to you in detail.

As an additional learning aid, the flip side of the disk contains templates for a dozen sample spreadsheet applications. Included are: checkbook balancing, starting a business, job offer analysis, and mortgage payment schedule, among others. These templates provide some good ideas on how to get started setting up your own applications.

There are also three printed reference aids in the Multiplan package. The manual is a spiral-bound volume over 150 pages thick. It is clear, concise, and tutorial, and includes a table of contents and index. There is also a 30-page Quick Start manual for those who want to get right into using Multiplan using the templates. The third printed aid is a one-page quick reference card for the most-used

#1	2	Cleaning	10	8
32		Repairs	11	DEC
33		Pest Control	12	---
34		Trash	13	0
35		Dues, Subscriptions	14	0
36		Other	15	0
37			16	0
38			17	0
39		AL EXPENSES	18	---
40		OPERATING INCOME	19	0
41		n Payments :	20	0
42		First Mortgage	21	0
43		Second Mortgage	22	0
44		RETAINED INCOME	23	0
45			24	0
46			25	0
47			26	0
48				
49				
50				

COMMAND: **BLANK** Blank Copy Del Edit Form
 Go Help Ins Lock Move Name Opt Print
 Quit Sort Transfer Value Window Xtern
 Select option or type command letter
 R19C8 SUM(R13:17 C) 78% MANAGE PR

keyboard commands. Every capability of this spreadsheet program is fully and clearly documented not one but several times, in varying degrees of detail.

In addition to the HELP key, all of the C128's special keys are enabled. ESCape, TAB, CAPS LOCK, the function keys, and the numeric keypad are all active. Many commands also have alternate short-cut variations for convenience. For example, CTRL-W will move you into the next screen window without going through the menus. As an added user convenience, the escape function has been implemented in the ESC key for those who are used to the C128, the RUN/STOP key for those familiar with the C64, and CTRL-C for those making the move from a CP/M environment. It's nice to see so much forethought and freedom from user frustration in a product's implementation.

CAPABILITIES

Multiplan gives you a 63 row X 255 column spreadsheet environment. If you need more, you can link additional spreadsheets. EXTERNAL references pull data from linked spreadsheets to use in the current model.

Multiplan

continued...

As it powers up in the 80 column display mode, this program displays 7 columns by 19 rows of information. The rest is available by scrolling with the cursor controls, or you can set up to 8 split-screen windows to simultaneously display different portions of your spreadsheet. Besides the spreadsheet cells and menu bar, the screen constantly displays the percentage of free memory and the address of the cell the cursor is currently occupying.

Each cell can contain numeric information, an alphanumeric label, or a formula. Calculations are performed with a precision of 14 digits of accuracy, with a displayable range of 1×10^{-63} to $9.999999999999 \times 10^{62}$. In addition to the normal math functions, **Multiplan** formulas can include trigonometric functions, IF...THEN conditionals, LOG functions, MOD division, MAX and MIN, and several statistical functions including standard deviation. There is also a LOOKUP function for using values from tables. In addition, ISERROR provides for error checking and handling.

Perhaps one of **Multiplan**'s most impressive features is its capability to perform iterative operations. For example, if you have a situation where a salesman's commission is based on 10% of company profits after commission deductions, you would generally have to use an algebraic formula to figure his pay. With **Multiplan** you can set up a formula to calculate commission and profit in an interrelated formula. The iterative calculation option will then run through the related calculations until they converge on a solution. You can actually sit and watch the values displayed on the screen change and converge on the answer!

Multiplan's editing capabilities are as powerful as any I've seen, and include the capability to MOVE, COPY, INSERT, and DELETE rows, columns, and blocks of cells at will. You can create formulas by motoring around the screen with the cursor controls, picking up cell addresses and inserting them into your formulas with the press of a key. You can also optionally NAME cells and use the names in your formulas (as in, for example, SUBTOTAL + TAX instead of $R[22]C[19] + R[43]C[12]$). GOTO can reference

a cell name as well as its row & column address. You can also use absolute or relative cell addresses in formulas, saying, for example, $R[+1]C[-2]$ for the cell one down and two to the left of the current cell. Once you have your formulas in place, you have the option of LOCKing ones you don't want changed. Once your data are in place, you can SORT on any column to organize your information in any manner you wish.

FORMAT lets you define how you want your information displayed. You can specify dollars and cents format, fixed point, floating point, width of the cell, and all kinds of stuff. If you define an alphanumeric label longer than the defined cell width, it will automatically wrap over and display fully on-screen.

You have three different file options with **Multiplan**. There is a space-saving native binary file format which is compatible with other versions of **Multiplan**. There is also a SYLK file option for data exchange with other programs. The third option, called simply Other, is compatible with Visicalc. You can also choose to send formatted printed output to a file for compatibility with wordprocessors, or with Sideways from Timeworks.

The C128 runs at a speed of 2 MHz in 80-column mode. In 40-column mode the demands of the VIC chip require that the cpu run at only 1 MHz. If you are stuck with running in the 40-column mode, **Multiplan** lets you switch into High Gear during calculations. If you hold down the SHIFT key when you press RETURN after entering a formula, the screen blanks and the cpu shifts into 2 MHz while it recalculates the spreadsheet values. Then the screen is restored. This can speed up your spreadsheet operation considerably. Of course, the best thing to do if speed is extremely important is to turn off the automatic recalculation mode using the Options command, and only recalc manually when necessary. In either case, **Multiplan** compares very favorably with other spreadsheets in calculation speed anyway. If you are running **Multiplan** on a Commodore 64, the High Gear option will only speed calculations by about 10%.

Multiplan

continued...

HUH?

The only time I managed to get really confused with this program was while reading the license agreement. Though the agreement says "You may make one (1) copy of the program for backup purposes...", when I tried to make one I found that the disk was copy-protected. Though I'm sure one of the copy programs floating around the office would have copied it if I'd looked long enough, I was pretty distressed to find out that it was going to take considerable detective work to exercise my rights under the license agreement! A phone call to the company confirmed that the disk is protected, but they will make backups available for a \$10.00 fee.

The license goes on into the legalese currently in vogue among software publishers, to the effect that they'll guarantee the disk is okay for 90 days, but they don't guarantee that the program will work, or that you will be able to use it for anything even if it does. It's too bad that the lawyers have got software companies convinced that consumers are just waiting like vultures for the opportunity to sue their pants off if given the opportunity.

CONCLUSION

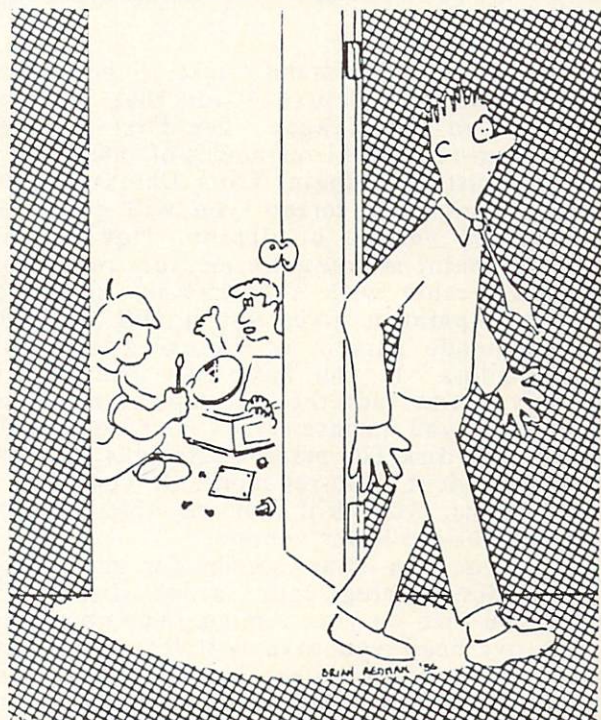
Multiplan is a good, solid, well-established spreadsheet program that will probably meet all your needs. It's easy to use, has many powerful features, and seems to run fast enough, especially in C128 80-column mode. Many provisions have been made for user-friendliness and utility. And Epyx is a good company with a reputation for solid user support. All in all, Multiplan seems to be a safe bet.

POSTSCRIPT: C64 MULTIPLAN

Though it has most of the same features as the C128 version, the C64 version of Multiplan, supplied on the same disk, is less pleasant to use for one very simple reason: because of memory restrictions, it is modular. Most of the functions you access will have to load in a module before they can do their job. Needless to say, the disk load times involved make it much more tedious to use, though the final results are the same. Recommended only if you are a patient sort.

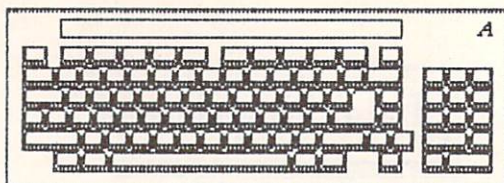
Microsoft Multiplan, from:

Epyx
1043 Kiel Court
Sunnyvale CA 94089
(408) 745-0700



"...who says you can't fix a hard drive yourself?"

Amiga NOTES



DELUXE PAINT TRICKS



There are already some tricks to be passed along concerning Deluxe Paint that are not mentioned in the manual. The first involves the medium-res and hi-res modes of operation.

If you just type `dpaint` from Deluxe Paint's opening AmigaDOS screen, you will get a lo-res 320X200 version of `dpaint`. However, if you type `dpaint m` you get a medium resolution 640X200 version with a palette of 16 colors. Likewise, `dpaint h` gives you a full 640X400 interlace mode version of Deluxe Paint with sixteen colors. If you have two disk drives, you may notice that the medium-res mode no longer gives you a spare screen, and hires mode accesses the disk for many operations that are memory-resident in lo-res mode. If you have a 256K Amiga, you will not be able to run anything but the lo-res version.

If you need a swap screen for med- and hires modes, unplug your second disk drive before you turn on your Amiga. The operating system overhead you save will leave you just enough memory to squeeze in a swap screen. Fortunately, Deluxe Paint is smart enough to adjust to the amount of free memory your system has available.

Another DPaint trick that we've found useful is to run DPaint as a multitasking application. That way you can go back and change your Preferences, use AmigaDOS, etc. There are two ways to do this. If you have two drives you can stick the Deluxe Paint disk in drive one and boot up under a regular Workbench disk in drive zero. Open a CLI and type `cd df1:`. You can then load and run DPaint by typing `run dpaint`. If you need to access another program, just slide down the DPaint screen and click on the CLI with your mouse pointer and you're in business. When you want to go back to DPaint, slide up the screen and click somewhere with the mouse.

You can do the same thing more economically by simply copying the `run` command from your Workbench disk to your DPaint disk. Put the Workbench disk in your drive and copy `c/run` to DPaint. For a dual drive system the command is `copy c/run to df1:c`. If you have only one drive, use the single drive copy syntax listed in the AmigaDOS ergcard in this issue. You can then boot the DPaint disk at the Workbench prompt as usual, but type `run dpaint` to enable switching back and forth with other applications.

SAVING MEMORY

Sometimes even 512K is just not enough. If you need to save just a couple of thousand bytes of memory, here are some things you can do:

(1) If you are running from the Workbench, try dragging the icon of the program you are going to run out of its window onto the Workbench. Close its window, then double-click on the icon to open it. You've saved 8K or so.

(2) You can recover a similar amount of memory for each parent window you close before opening an application. If you have to open two windows to get to a program icon, you can save 16K or so.

AmigaNotes

continued...

(3) If you have two drives hooked up, but can get along without the second while you are running the offending program, unplug it before you power up. You'll get about 22.5K back.

(4) If you use a bare-bones CLI disk, you'll save a lot of overhead compared to a full Workbench disk. I suggest you get familiar with AmigaDOS before you graduate to this level.

SNAPSHOT

Even though it's documented in the Amiga manual (page 4-33), there seems to be some confusion about how SNAPSHOT works. SNAPSHOT is used to clean up window and icon placement under the Workbench, since when you add or move icons around they tend to get messed up. SNAPSHOT is on the rightmost pull-down menu on the Workbench screen, but you can't just select it without doing some manual moving around first. Here are the steps involved:

(1) Open the window you want to clean up.
(2) Move and resize the window as you want it to appear.

(3) Use CLEAN UP on the third pull-down menu to reorganize the icons in the window.

(4) If step 3 didn't do all you wanted it to, resize the window and try again, or move the icons around yourself by clicking on them and **holding** while you move. When you release, the icon will move to its new position.

(5) If step 3 did nothing at all, it's because somewhere along the way its parent icon got deselected. Whatever you double-clicked to open the window you are trying to fix, just single-click it now to select it (it will be reversed) and step #3 should now work.

(6) Once everything is the way you want it, hold down a shift key with your other hand while you move the mouse, selecting every icon in the window by single-clicking on it. If the parent icon (explained above) is deselected, click on it, too.

(7) Now you can choose SNAPSHOT from the pull-down menu. Your new arrangement will be saved to disk (provided you remembered to slide the write-protect tab shut), and the next time you open that window it will look just like you wanted it to.

You can move and SNAPSHOT disk icons, too. They'll stay pretty much where you put them when you next stick the disk in the drive.

ED COMMANDS:

EXTENDED:

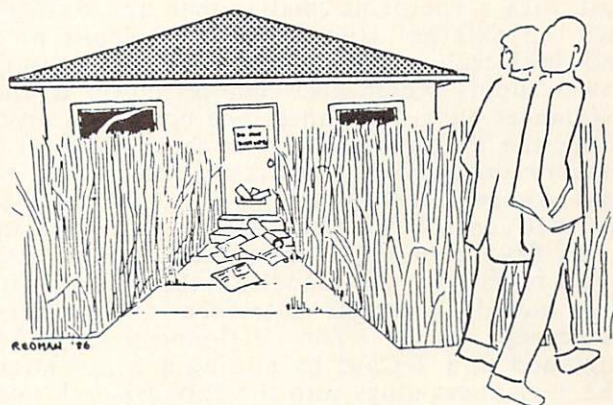
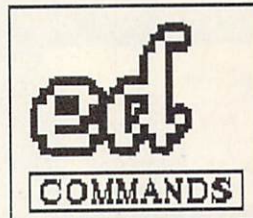
ESC followed by:

A /s/	Insert After	J	Join Lines
B	Bottom	LC	Lower Case
BE	Block End	M n	Move to Line# n
BF /s/	Backwards Find	N	Next Line
BS	Block Start	P	Previous Line
CE	CRSR/Endline	Q	Quit w/o Save
CL	CRSR/Left	RP	Repeat Command
CR	CRSR/Right	S	Split Line
CS	CRSR/Startline	SA	Save Changes
D	Delete Line	SB	Move/Start of Block
DB	Delete Block	SH	Show Status
DC	Delete Char	SL n	Set Left Margin
E /s/t/	Exchange s/t	SR n	Set Right Margin
EQ /s/t/	Exchange/Query	ST n	Set Tab Spacing
EX	Extend Margin	T	CRSR/Top
F /s/	Find s	U	Undo Last
I /s/	Insert before	UC	Upper Case
IB	Insert Block	WB /s/	Write Block to File
IF /s/	Insert File	X	Exit/Save Changes

IMMEDIATE:

CONTROL/

A	Insert Line
B	Delete
D	Scroll Down
E	Move to Top/Bottom Screen
F	Flip Case of Char
G	Repeat Command
H	Backspace
I	Tab
M	RETURN
O	Delete To Space
R	Back/Word
T	Ahead/Word
U	Scroll Up
V	Update Screen
J	Move to Other End of Line



"...yeah, poor guy, he's got something called 'Amiga'."

Tecmar T-Disk



20 MEG HARD DRIVE



Tecmar's 20 megabyte T-Disk hard disk drive gives you 20 megs of AmigaDOS-compatible, reliable, but somewhat slow on-line storage for a pretty stiff price: \$1945 (\$1495/drive + \$450/interface).

The T-Disk is a small 3.5 hard disk drive unit with a footprint smaller than the Amiga's own 3.5 external floppy drive. It looks nice and high-tech. It is powered by a separate power supply which also supplies power to the T-Connect hard drive interface box. You need either the T-Connect (\$450) or the T-Card with memory expansion to interface the T-Disk to your Amiga. The T-Card is not yet available, but will cost \$795 with 256K of expansion RAM, \$895 with 512K, and \$995 equipped with a full megabyte. All models of the T-Card will also include a serial interface and battery backed-up clock. The T-Connect can be upgraded to a T-Card by adding a board later. The T-Connect plugs into the expansion slot on the right side of the Amiga, increasing its width by about two inches. It matches the Amiga case nicely, melting in unobtrusively. At the front are two joystick/mouse ports, moved there from the side because the box

covers up the Amiga's ports. The T-Disk plugs into a rear connector, as does the power supply cable. When you are done setting up, the whole thing takes up only a little more room than the Amiga itself if you disregard the power supply, which has cables long enough to allow it to be placed off the tabletop.

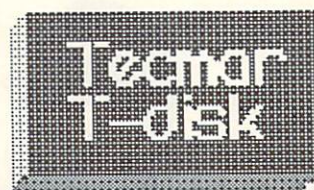
Physical installation is straightforward, requiring plugging the T-Connect into the side of your Amiga, moving the mouse connector, and hooking up the power supply and drive cables.

Software installation requires modifying your Workbench disk. This is a two-step process. First, you load and run a T-Connect installation program, then you load and run a T-Disk program. Both programs run from the Workbench by simply pointing and clicking, so the process is relatively painless. The Tecmar drivers take about 55K away from your Amiga's available memory. From then on, when you load Workbench a temporary T-Disk installation window automatically opens and activates the hard disk.

After the software is installed on your Workbench disk you'll get a hard disk icon on-screen as well as your usual Workbench icon. If you open either you will find an icon for the T-Disk Manager, a utility you can use to test your drive's operation, remount it, reformat it, or park the heads for safe moving. You will also see an icon for the T-preferences utility, which can be used to reconfigure the T-Connect interface as a second parallel printer port instead of a hard disk controller if you want.

If you are accessing the T-Disk from AmigaDOS, or under program control, it is addressed as drive DH0:. Since a hard drive gives you access to such huge amounts of storage, it is absolutely essential that you organize your files logically in nested subdirectories. Fortunately, AmigaDOS gives you all the tools you need to do this quickly and effectively. A hard drive looks and acts just the same as a floppy disk to your Amiga.

Besides increased capacity, the T-Disk is also somewhat faster than a floppy disk drive. Deluxe Paint pictures load twice as fast. Most



continued...

programs also load two to three times faster. Workbench icons come up about two and a half times faster, too. I'm not quite sure why you don't get a greater speed increase than that; it was our expectation that a hard drive would be at least ten times faster than the floppies. The folks at Tecmar say that AmigaDOS is the culprit, but the developers of AmigaDOS say the problem lies with the way Tecmar implemented their drivers. Until we get other hard drives in to test, or Commodore issues another AmigaDOS upgrade, I guess we won't be able to tell which is at fault. Suffice it to say that for the time being, you can only expect to get about two to three times the speed of an Amiga floppy disk drive out of the T-Disk.

The other ever-present question when discussing hard disk drives is: What about backup? Most drivemakers will tell you that a streaming-tape backup is the only fast, reliable way to backup a hard disk, unless you can afford a second hard disk just for backup of your first. (The T-Disk interface will only allow you to hook up one hard disk, so that's not an option here, anyway.) The T-Tape streaming-tape backup unit is still on the drawing board at Tecmar, so it's going to be awhile before you'll be able to quickly back up your T-Disk. In the meantime, you'll be stuck with backing up to floppies with the AmigaDOS COPY command--not a quick process. Let's hope the streamer arrives soon.

The only compatibility problems you are likely to run into while operating the T-Disk involve copy-protected software. It was impossible for us to install the T-Disk and T-Connect drivers on Deluxe Paint, for example. We had to install them on a generic Workbench disk and run DPaint from DFL. There is also no way to move DPaint itself from floppy to hard disk, because of its copy protection. This is no fault of Tecmar's, but rather the copy protection that Electronic Arts chose to put on the DPaint disk. With a machine like the Amiga, it becomes even more important to address the copy protection issue and the limits that it puts on a computer's usefulness.

Our conclusions? Well, the speed (or rather, the lack of speed) of this drive under AmigaDOS is a major disappointment. The

price is another problem. Originally the T-Disk was to be offered for \$999. That was exciting. At \$1495 plus \$450 for an interface, the excitement is gone. The T-Disk is reliable, and works well with AmigaDOS; the increased storage is much appreciated. If you need hard disk storage for your Amiga now, the T-Disk as it works currently will do it for you. But the price and speed questions are enough to make us hold back from buying one, at least for now.

The T-Disk 20 megabyte hard disk is \$1495, T-Connect \$450, from:

Tecmar Inc.
6225 Cochran Rd.
Solon OH 44139
(216) 349-1009

A TIME



AmigaDOS time-and-date stamps a file every time you update it. You can even access files with some commands based on this information. You can also access the system time and date via the DATE command, and even use it in your programs. And, of course, there is that nifty clock program on the Workbench disk. The only problem with all this is that the clock is system-power dependent. Anytime you power down or reboot, the system clock is reset and you have to set it again. With all of its other capabilities, the Amiga lacks a battery-backed-up clock.

A-Time is just that--a battery-backed-up clock. No more, no less, and you can add it to your Amiga for \$49.95. It comes in a small case, slightly smaller than a pack of Camel straights, that plugs into the Amiga's parallel port. There is a pass-through connector for your printer, and it doesn't seem to interfere with the parallel port's other operations at all. (Though the port can interfere with it; read on.)

The software installation requires you to go into AmigaDOS and copy a file to your Workbench disk, as well as editing a line into the :s directory's startup-sequence file. The installation sheet tells you how to do all this step-by-step. When you are done, your Amiga will get its time from the A-Time clock, not the volatile system clock. The user-replaceable battery in the A-Time module should last under normal conditions for three years or better.

continued on pg. 84

Amiga Microsoft BASIC

by Mark R. Brown



SOME BASIC DIFFERENCES

Calling all versions of BASIC "BASIC" is like calling all cats "CATS". There are many similarities between a panther and an alley cat, but you want to have the differences clearly understood before you choose one as a pet.

Likewise, BASICs vary all over the map. Some of the early versions of the language did little more than perform simple integer math calculations and print the answers on your teletype terminal. Their major advantage was that they took up less than the 8K available in early micros and still left you with 3 to 4K of RAM for your source code. Even Commodore 64 BASIC 2.0 is little more than a full 8K+ version of that early BASIC expanded to cope with floating point calculations. C128 BASIC is a more complex beast, taking up 32K of ROM and adding graphics, sound, and system commands by the basketfull.

There have also been BASICs from different sources that are very different animals, indeed. Hewlett-Packard BASIC doesn't much resemble Microsoft BASIC. Apple Integer BASIC is different even than Applesoft BASIC. And Atari BASIC is something else again. You've also got to understand that even Microsoft BASIC is different on different machines.

In its short lifetime, the Amiga has already gone through two very different versions of BASIC. The latest and best is Microsoft's Amiga BASIC.

MICROSOFT AMIGA BASIC

Don't call it MBASIC. The official name is Amiga BASIC, and it's from Microsoft. Microsoft is generally regarded as the ipso-facto standard for microcomputer BASICs. Commodore's first relationship with Microsoft BASIC began way back in the halcyon days of the PET 2001. The founder of Commodore, Jack Tramiel, ever the slick negotiator, cut a deal with a very young Microsoft which allowed BASIC to be included in the ROMs of the original PET for a ridiculously low one-time flat fee--some say as little as \$10,000. Once the folks at Microsoft had developed a little keener business acumen, they began licensing their BASIC on a per-machine basis, an arrangement that brings them millions. In

the meantime, Commodore kept moving BASIC on up to later PETs, and even the VIC and Commodore 64, without having to pay anything for it. The "Microsoft" did not even appear on the Commodore screens as part of the copyright notice. That is, not until the Commodore 128. The Microsoft name appears side by side with Commodore's on the power-up screen of the C128, indicating the start of a new relationship between the two companies. One has to assume that most of the credit for the new amiability has to rest with the agreement to have Microsoft supply BASIC for the Amiga.

FIRST IMPRESSIONS

Amiga BASIC is almost everything you would hope it to be. It is fast, powerful, and easy to use. But if you are used to BASIC on an 8-bit machine, Amiga BASIC will look different to you.

In the first place, Amiga BASIC powers up displaying two windows. On the left is the BASIC window, on the right the List window. They are for just what they say they are for. You edit your BASIC program in the List window, and when you run it the output goes to the BASIC, or output, window. You also type any direct commands in the BASIC window. Like most Amiga applications, the menu bar lets you access many system functions directly by using the mouse, though most have an alternate key-entered command. For example, you may run a program by pulling down the Run menu and selecting Start, or by simply typing RUN in the output window.

Secondly, Amiga BASIC is multitasking. The two BASIC windows co-exist with your normal Workbench environment, which can, of course, include several open icon windows, a CLI window, running programs, desktop accessories, etc. (I usually keep a CLI window open so I can handle disk operations.) In fact, Amiga BASIC leaves approximately 230K in a 512K system for other applications, while reserving 24K for BASIC text. If this is not enough, RAM can be dynamically allocated among the stack, the system heap, and BASIC via the Clear command. For example, Clear, 51200 will free up 50k of BASIC RAM.

Amiga Microsoft BASIC

continued...

Third, there is such a huge library of additional commands for graphics, music, speech, sprites, mouse control, windowing, animation, et. al., that you are sure to be overwhelmed. The best thing to do at first is to play with the commands you are already familiar with and add new ones as you need to. Amiga BASIC is such a rich language that I am sure that most of us will never explore more than a fraction of its capabilities. Amiga BASIC is very compatible with IBM/PC and Macintosh BASICs, which should simplify conversion of these programs to run on the Amiga.

AN AMIGA BASIC SAMPLER

Here's a quick look into some of the capabilities of Amiga BASIC:

STRUCTURE, STYLE, AND POWER: You can tell right away that Amiga BASIC is a member of the latest generation of BASIC interpreters. Many features have been borrowed from other languages. Line numbers are not necessary, though you can use them if you wish; lines can also be labeled for reference by GOSUB and GOTO. Procedures (called SUBPROGRAMS) can be defined and called by name, and all subprogram variables are local by default, or may be declared global via the SHARED command. Structures include IF/THEN/ELSE and WHILE/WEND. Error handling is supported with ON ERROR GOTO, and runtime debugging is possible with trace and step functions. Amiga BASIC can make use of strings up to 32K in length. Both short and long integer and single and double-precision floating point math can be used, with up to 16-digit accuracy. You can also designate and work with integers in octal and hexadecimal form.

SOUND AND SPEECH: WAVE and SOUND are used respectively to define and play any of the Amiga's four DMA sound channels. WAVE defines the sound envelope for a specific voice, SOUND picks a voice and plays a note of a desired frequency, volume, and pitch. The WAIT and RESUME options are used to synchronize and control timing. SAY is the command that tells the Amiga to talk. You can optionally set up to nine different parameters for the voice used, or just let the Amiga speak

in its default male expressive voice. Since SAY operates on phonemes, TRANSLATE\$ converts text strings into phonemes for use by SAY.

GRAPHICS: It's hard to know where to start. All the standard graphics commands are here--CIRCLE, PAINT, LINE, and so on. But there are also commands for defining your color palette, setting up graphic screens, opening screen windows, defining and animating sprites and bobs, patterns, and on seemingly forever. There are sixteen separate commands just for the definition, movement, and manipulation of screen objects. There is even an (admittedly crude) object editor for defining sprites and bobs. If the Amiga can do it graphically, it seems like Amiga BASIC can, too.

USER INTERFACE: All of the nifty stuff that makes the Workbench so nice to use can be accessed from Amiga BASIC. You can define screens, windows, and menus, and use the mouse to click and select actions. Icons can be defined using bobs.

OTHER STUFF: Besides all the other stuff, Amiga BASIC gives you timer interrupts, print formatting, control over system parameters, machine language library files, substring manipulation, user defined functions, and even a beep. And in addition you get a high degree of IBM-PC and Macintosh BASIC compatibility.

CONCLUSIONS

For free, you couldn't ask for anything better than Microsoft's Amiga BASIC. Commodore is to be commended for getting rid of ABASIC and giving us a piece of software as well thought out and valuable as Amiga BASIC.

POSTSCRIPT

Though it is already as fast as many BASIC compilers, Amiga BASIC is an interpreter. The biggest improvement you could make to Amiga BASIC is to give it a compiler. One is on the way from Absoft and should be available sometime in June or July. The price will be somewhat steep: \$295. But if you need the speed advantage (up to 50X faster for compute-bound programs), it may be worth it to you.



ATARI ST BASIC & ABASIC

ATARI 520 ST BASIC

The long-delayed BASIC for the 520ST is much slower and more difficult to use than Amiga BASIC. It powers up with four windows onscreen, though you might miss the Edit window hidden behind the others. (By the way, four is the maximum number allowed by the ST's GEM operating system.) Writing a program is a tedious process of entry in the Command window, listing in the List window, editing in the Edit window, and watching your program run in the Output window. Editing is an especially exasperating experience. Deleting lines leaves behind ghosts, and even a line currently being edited is a difficult-to-read ghost while you are trying to work on it! The Edit buffer works on a screenful of text at a time, with cumbersome screen loads and saves to disk in between. Most of the normal screen-editing keys are disabled (INSERT and HOME keys just leave behind strange symbols). Instead, you must use the commands on the drop-down menus or function keys. Listing from the edit mode gives you a listing in the List window which is quickly covered up by the reappearance of the Edit window. It's a real pain.

Entering a program takes you back to the old line-editor days (just like ABASIC, if not worse). An error results in a cryptic Something Is Wrong! message. You then must retype the entire line or enter the editor. Many things are just plain not intuitive, like having to type CTRL/G to quit AUTO line numbering, or using F10 to exit the editor. Many commands are implemented in a weird manner: RENUMBER, for example, rewrites your entire source file to disk, then reads it back in, renumbering as it goes.

The difficulty of working with this BASIC is perhaps best illustrated by the fact that there are no demos on the disk, and only a couple of short listings in the manual. The manual is only 17 pages long, with 100+ pages of appendices explaining the keywords and system. ST BASIC is a hefty 138K of code, which along with the disk-loaded version of TOS does still leave you with a substantial 138K of program memory in a standard ST.

The benchmarks we ran showed the ST much slower (of course) at graphics operations on a full-sized screen than the Amiga. However, even the ST's much-touted 8 MHz clock speed did not let it come close to the Amiga in a straight math operation like addition. We clocked Amiga BASIC at over 700 additions per second versus ST BASIC at about 400 per second. In fact, the C128 in 2 MHz 80-column mode was exactly as fast at BASIC addition as the 520 ST!

Execution speeds of graphic programs (even those that just printed to the screen) varied widely with the width of the output window. The benchmark array-fill program ran as fast in the small default ST output window as it did on the full-screen Amiga display. But when the ST's output window was increased to a 40-column full-screen size, the execution time tripled! When we tried to run in 80-column mode (the same as our Amiga test), the ST crashed with an Out of Memory error. It seems that 138K was not enough to run our eleven-line test program!

I think Atari was hoping that ABASIC was the BASIC they would have to compete with on the Amiga. If that were so, they could have at least finished a graceful second. As it is, ST BASIC is a joke when compared to a powerhouse like Amiga BASIC.

ABASIC

The BASIC originally shipped with the Amiga was ABASIC from MetaComCo. ABASIC was brought down from a mainframe to the Amiga just to fill the gap until MicroSoft BASIC was ready. It has many problems, among them: (1) slow speed, (2) unimplemented commands, (3) a terrible line-oriented editor, and (4) non-standard syntax. Because of its problems, most people will jump at the opportunity to switch to MicroSoft BASIC. However, we ran a couple of quick benchmarks with ABASIC that did surprise us. For example, in filling a thousand-element array with the squares of the array index (e.g. $a(x)=x^2$), ABASIC was faster than MicroSoft BASIC (six seconds versus nine.) Besides that, the Amiga MicroSoft BASIC interpreter came up with a couple of values for the squares that were a decimal or two off due to rounding errors. The ABASIC values were all solid, right-on. Keep in mind that these are only two plusses in a field of minuses; it was also only half as fast overall as Amiga BASIC. Still, it might be prudent to hang on to that old copy of ABASIC, just for old time's sake. You might find it useful in some situations.

BASIC benchmarks

machine:	C64	C128	520 ST	AMIGA	ABASIC
columns:	40	40 80(a)	40 80	60(b) 80	40 80
CIRCLE	(c)	1:58 (c)	:06 :46	:10 :19	:09 :29
ARRAY(d)	1:44	2:05 1:22	4:30 (e)	1:54 1:56	:58 2:32
ADD/SEC	250	192 400	416 400	714 714	476 213

notes:

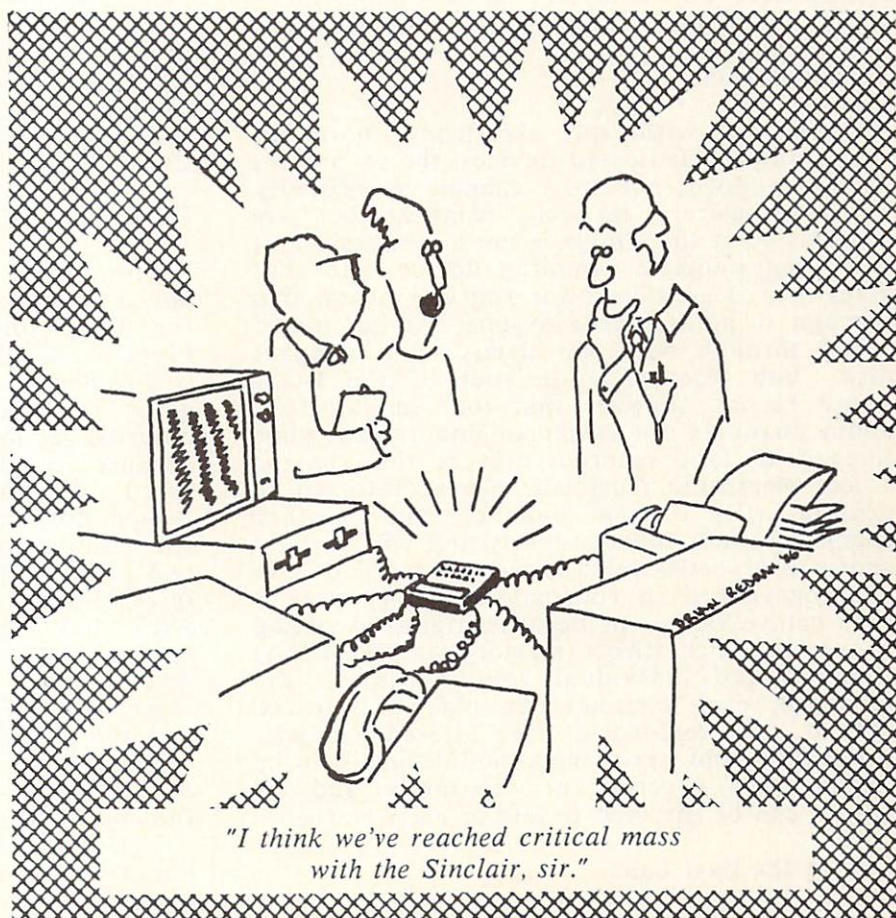
- (a) C128 80-column figures are in FAST 2MHz mode.
- (b) Amiga BASIC figures are for 60/80 columns.
- (c) Command not available.
- (d) The 32-bit BASICS filled the array much more quickly, but were slowed down considerably by their slower print scrolling times.
Notice that the C64 beat both the ST and Amiga BASICs!
- (e) Insufficient memory to run.

GRAPHICS BENCHMARK

```
CLS
FOR X=0 TO 100
  CIRCLE (X,X),X
NEXT X
```

ARRAY BENCHMARK

```
PRINT START
DIM A(1000)
PRINT "DIMENSION DONE"
FOR X=0 TO 1000
  A(X)=X^2
NEXT X
PRINT "FILL DONE"
FOR X=0 TO 1000
  PRINT A(X)
NEXT X
PRINT "FINISHED"
```



Sound Advice

by Peggy Herrington



The Musical AMIGA

Electronic musicians know that personal computers don't make good musical instruments. Let's face it: PCs sound more like portable radios with head colds than dedicated music synthesizers, and while that may be perfectly acceptable for recreation or education, it is anathema to a serious musician.

This seems strange considering the similarity between computers and synthesizers. Both are electronic tools made primarily from plastic, metal and silicon, and equipped with borrowed keyboards (typewriter and piano). Through MIDI, a computer can even provide musical compatibility between different brands of synthesizers but it wasn't until Commodore's Amiga that a PC offered really quality sound.

The Exception

Operating with an efficiency normally found only in dedicated devices, the sounds the Amiga produces not only compete successfully with synthesizers, in some instances they are superior. Yet the Amiga is not a synthesizer; it is a programmable sampling device, and that gives it even greater power and flexibility. Put through a home stereo system, Amiga music comes through with the clarity of a compact disk. Bob Hoover, co-designer of the ROM sound kernal, suggests that the Amiga's four audio channels are easier to understand when likened to tape recorder/players than to the voices electronic musicians are accustomed to dealing with. Each channel can produce complex sounds independently and will sound a chord as effortlessly as it will beep. They can be programmed in four-part harmony over a nine octave range, or, because digital-to-analog converters with direct memory access (DMA) channels and individual volume controls are provided, each channel can play a digitized sample of real-world or altered sounds. Amplitude and frequency modulation can be implemented together or separately and all output can be directed to left or right stereo.

Life in the Fast Lane

Until the Amiga proved otherwise, software

control of a computer's operating system was considered necessary for flexibility, even though direct hardware operation was obviously faster. So even though the 16/32-bit Motorola 68000 microprocessor runs at roughly the same operating speed (7 to 8 MHz) in Atari's 520ST and Apple's Macintosh, the fact that it is aided and abetted by three custom chips in the Amiga makes all the difference. This hardware-controlled environment works with direct memory access (DMA) channels and integrated circuitry so unique that many tasks bypass the microprocessor completely. Portia, the custom sound-I/O chip, for example, can handle sound production all by itself and one of the other chips contains a graphics co-processor. This design makes the Amiga revolutionary -- it can run circles around other computers, sing in harmony with professional music-makers, and rub its tummy while patting its head (multitasking) in the meantime.

Hardware and Software Trade-offs

The Amiga specifications do not reveal the power of its sound system. If you're looking for VCOs and VCAs, 4- or 6-part ADSRs, supplied waveforms or the number of programs (instrumental timbres) that come with it, you're going to look a long time. Those features describe a dedicated music synthesizer and because they had to be fixed in hardware for speed, the trade-off was flexibility. The Amiga doesn't have to make this sacrifice -- it's a sampling device, remember? In essence, two sets of digital tape recorders that get their instructions from computer memory. There ARE no VCOs or waveforms or ADSRs in the Amiga; it comes with no preprogrammed instrumental timbres. This degree of flexibility, of course, has its trade-off: all musical parameters must be supplied or computed by a program. (Before you hit the panic button, check-out the musical products at the end of this article.)

The strength of a sampling device is that it does what a synthesizer does and then some. Voltage controlled oscillators (VCOs) in synthesizers produce sound by comparatively

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simple back-and-forth vibrations. The result is that some complex sounds are impossible for VCOs to reproduce satisfactorily -- drums, for example, which is why drum machines are commonly used with even the more expensive synthesizers. But sampling devices vibrate every-which-way. They're great at sounds like drums and pianos and saxophones because they can play (what else?) digital samples of them.

Digital Sampling

The idea behind sampling is to come up with a sound for an instrument timbre in a piece of music. Mimicking real instruments is indeed useful but sampling has other applications as well. Sound in a computer is recorded numerically (unlike magnetic tape) and numbers representing pitch are stored separately from those for timbre (the qualities of a sound that differentiate flutes from pussycats, for instance). Thus, anything audible can be sampled and stored in RAM: a babbling baby or barking dog, shattering glass, an orchestral chord, the roar of a motorcycle or plop of water on metal, and then altered in pitch, speed, modulation, direction, timbre, length, ad infinitum.

Sampling is very memory intensive -- notice it is not called digital recording. We're talking seconds, and it uses so much memory that you can go for quality or quantity in a sample, not both. Using a principle that's similar to the way a series of still photos are turned into motion pictures, soundwaves are analysed and recorded as tiny discrete values (representing frequency, amplitude and timbre). The smaller the interval is between the values, the better the quality of the sample; also the more memory it takes. These numbers are played back very rapidly and the steps are smoothed away by low-pass filters provided for each stereo channel. Sampling quality in the Amiga can be improved with a programming technique reminiscent of Dolby noise reduction that combines 8-bit samples with the 6-bit volume controls provided for each sound channel to produce the effect of 12-bit sound resolution -- it's as good as many professional

synthesizers.

Libraries of sampled sounds will undoubtedly become available but with the right equipment (which will soon be available commercially) you can roll your own. The digital-to-analog converters in the Amiga will play samples but to record them you'll need an analog-to-digital convertor with a microphone or tape recorder for input, sampling software and your ears.

The Amiga can also be programmed directly in four-part harmony by establishing waveforms and ADSR envelopes numerically, and specifying pitches and durations. Microsoft BASIC sound statements make this easier than it might seem and the fact that routines are called by name rather than line number makes using subroutines from other programs practical. With the right file format, digitized samples can even be used in BASIC programs.

Sound in Other Computers

Digital sampling aside, how does the Amiga sound system compare with other PCs? Here's the run-down on their vocal chords along with a question: how many of them offer true multitasking, 2-channel stereo output and built-in speech synthesis?

ATARI'S 520ST (60000 at about 8 MHz), like the orphaned IBM PCjr and TI/994A, uses the General Instruments Sound Chip. It was a fine chip in its day, with three voices, each with frequency and volume controls, ADSR envelopes and a noise generator. But the 520's musical claim to fame (its built-in MIDI IN and OUT ports) has no bearing whatsoever on internal sound generation. It's a limited part of a communications system called MIDI (explained below).

APPLE IIe (65C02 operating at 1.02 MHz) produces a single voice. As the first PC with a built-in speaker, it was instrumental in bringing computer music out of universities and that, combined with its open architecture (a philosophy wholeheartedly adopted by Commodore with the Amiga) spawned a number of independent add-on music systems,

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continued...

many of which are still going strong. There are more MIDI products for Apple than any other computer.

MACINTOSH: Like Atari, Apple's Macintosh (about 7.8 MHz) controls the 68000 by software, and nowhere is the difference between hardware and software control better illustrated than by comparing Macintosh and Amiga sound systems. The Mac makes 4-part music with four software-driven voices. Since it has only one sound channel, making Mac music uses over 50% of the microprocessor's time. Compare that with the Amiga's four audio channels that don't access the 68000 AT ALL. Several MIDI packages are available for the Mac.

BIG BLUE: The IBM-PC (Intel 8088 at 4.77 MHz) like the Apple IIe, sings solo without additional hardware. High-end musicians prefer the IBM as a MIDI computer since it is relatively fast, more easily expanded than the Apple or Commodore and has greater snob appeal. That, of course, was B.A. (Before Amiga).

COMMODORE: The C-64 (6510 at 1.02 MHz) and C-128 (8502 at 1 or 2 MHz) both house a 6581 Sound Interface Device (SID) with three independent VCOs, each with a programmable sound envelope (ADSR). Four waveforms are concurrently available, and three filters and a volume control complete the system. Although the quality of its sound is not on a par with dedicated synthesizers, it's better than anything except the Amiga and second only to Apple in number of MIDI applications.

MIDI = Musican Instrument Digital Interface

Because computers haven't had top-quality internal sound, products for making music on them have been primarily for home or educational use. But that doesn't mean the professional music crowd isn't computer literate. Many of them use computers to control and establish communication between different brands of electronic musical devices with a hardware/software standard called MIDI. It has been universally implemented by

instrument manufacturers and computer programmers. Machine language instructions are carried by cables between devices and various MIDI computer programs allow entry, manipulation and storage of musical data.

Making music on a synthesizer is a whole lot easier than playing a piano -- it requires substantially less physical dexterity and the sounds are so much more complex and rewarding that fewer are needed. Most synthesizers can produce several different types of sound at once (multitimbral) but unless it offers a split keyboard it will produce only one type of sound when played live no matter how many keys are pressed. But with a computer and the right MIDI software, that same synthesizer can sound just like a group of instruments playing together. The idea is that music is entered slowly in step- or real-time, recording each instrument on its own sound track to the end of the piece. Previously recorded tracks can be sounded as subsequent tracks are entered. At any time during this process (depending on the software) music can be copied, transposed, rearranged or revoiced, after which the tempo is boosted and you can listen, sing or play along live. MIDI software offers printing sheet music, music education or games, and replacement instrument timbres for some synthesizers.

MIDI is the hottest thing in professional music today and a good deal of the music from popular recording artists, television and movies is done with it. Now that MIDI devices are becoming affordable (check out Casio, Korg and Yamaha) a MIDI home music studio with a synthesizer, a sampling device and an expander module (the guts of a synthesizer with no keyboard -- it costs less and with MIDI THRU can be sounded from another keyboard in the system) can be assembled for less than the price of many traditional musical instruments, especially if you already have the computer and stereo system.

MIDI Hardware

You'll need an interface to use the Amiga in a MIDI system. Commodore is making them

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for third-party developers who will sell them to the likes of you and me for about \$50. It plugs into the serial (modem) port on the back of the machine and has three 6 long cables (MIDI IN, OUT and THRU) as receptacles for cables leading to the first synthesizer in the system. Other MIDI units are daisy chained. Atari's 520ST built-in MIDI ports include only IN and OUT and the lack of a THRU will be limiting because some lower-priced synthesizers (the Casio CZ-101, for example) do not have THRU ports for chaining. While professionals will mourn the absence of advanced features on MIDIs for both Amiga and Atari (tape sync for example) they can bet that developers would rather upgrade the MIDI interface for the Amiga than work around the other's hardware ports.

Amiga Music Products

Products are now becoming available to harness the Amiga and provide equipment like a D-to-A convertor for sampling. Several of them will let you (1) make multipart Amiga-generated music or (2) enter MIDI musical data for synthesizers. Some will let you (3) combine these features, using Amiga sounds right along with synthesizers.

SoundScape and Modules from Mimetics, Inc. (P.O. Box 60238, Sta. A, Palo Alto, CA 94306) will let you use either Amiga-generated sound, external MIDI-synthesizers or both. Designed by Bob Hoover (who, with Sam Dicker of Amiga, developed the internal ROM sound kernel) this modular series of mix and match products is flexible, functional and fun. **SoundScape** (about \$89) includes a real-time sequencer for entering and playing music and it coordinates other optional modules ranging from tutorials with teaching overlays and personalizing tools, to sound sampling with an A-to-D convertor (about \$100), plus others. Don't miss this one if you're serious about music.

Pitchrider designed by IVL Technologies Ltd. (#3-3318 Oak St., Victoria, BC V8X1R2) is a hardware/software combo to be marketed by an undetermined U.S. company. Its an aid to

performance practice and is designed to work with **Concertcraft** (see below). A microphone picks up sounds from a monophonic instrument (wind instruments like flutes and clarinets work best says IVL), and feeds them in series to the Amiga where they are digitized and played by a synthesizer connected via MIDI. It happens so fast that the synthesizer seems to play along with the student as notes appear on the screen.

Deluxe Music Construction Set (\$99) from Electronic Arts (2755 Campus Drive, San Mateo, CA 94403) is one of EA's Amiga Deluxe series (Paint, Video, Printing). **Deluxe Music** supposedly lets you compose detailed, multipart music with lyrics and print-out sheet music. It uses both internal and MIDI sounds but whether they're available simultaneously isn't clear, nor is the method of note entry: must everything be clicked and drug with the mouse or is real-time sequencing available? Unlike other developers, Electronic Arts hasn't sent me early product for review.

Instant Music from Electronic Arts. Remember a little joystick-music program for the C64 called **Dancing Feats**? This one's based on the same principle: you play live mouse-music over 3-part internally-generated accompaniments, locking out sour notes if you want to. Delightful animated graphic displays. Save your creations to disk because EA says **Deluxe Music** will let you edit them.

The Music Studio (\$59.95) distributed by Activision (2350 Bayshore Frontage Road, Mountain View, CA 94039). Audio Light, Inc. designed this program for several computers but it utilizes the Amiga like it was written for it. Internal stereo as well as external MIDI-sounds can be used; you can switch instantly between composition screens that allow mouse or Amiga-keyboard note-entry, one in standard music notation, the other in simplified, educational patterns. **Music Studio** is great for refreshing a stale knowledge of music and it's perfect for starting from scratch.

Musicraft (around \$50?) from Commodore International (1200 Wilson Dr., West Chester, PA 19380) was written by Everywhere, Inc. (with help from others). This mouse note-entry

Sound Advice

continued...

composition program uses only Amiga-generated or sampled sounds for 4-part music. It features pull-down, scrolling score and instrument windows, standard music notation and a synthesizer screen on which you design and see waveforms, ADSRs, use modulation, etc. Sounds may be auditioned on the Amiga keyboard (here, they produce only one type of sound at a time but compositions may be polyphonic). It will no doubt be sold with copyright-free music files on disk so be sure to check public domain sources for compatible score and instrument files -- versions of A View To A Kill and Axel F among others I've heard are extraordinarily good.

Concertcraft which may again be called **Harmony**, was done by now-defunct Cherry Lane Technologies; who will market it is being negotiated. It requires either a MIDI synthesizer or an external piano-style keyboard for access to Amiga internal sound (with which it may be bundled for around \$100), and its premise is educational (sight-reading music notation). You pick a song from disk and using AI with speech synthesis techniques, the program will sound that song's 3-part accompaniment as you play the melody on the keyboard. Whether slow or fast, loud or soft -- you can even miss a few notes -- it follows you. Standard music notation is displayed on the screen.

Amiga Music Sampler from Micro-W (1342B Route 23, Butler, NJ 07405) is the first in a series of prerecorded Q-R-S music disks that require an external MIDI synthesizer and are simply for listening. The main screen shows a player piano and songs include Rhapsody In Blue as recorded by George Gershwin himself, excerpts from A Chorus Line, Arabesque, Piano Roll Blues, Do You think I'm Sexy, and Call Me Irresponsible. Disks are available separately or bundled with the Commodore MIDI interface for under \$100.



Power Without The Price...

*In INFO #9, we added \$500 to the cost of an Atari 520ST for a Casio CZ-101 music synthesizer to bring the ST's sound capability up to the Amiga's. Well, so did Atari, but not in quite the same way: At a trade show last fall, Atari was drawing yet another crowd with their Amiga bouncing ball emulator running on a 520ST when I strolled by (wearing an Amiga Press Badge). Now, I happen to know that the sound the Amiga makes when the ball bounces off the side of the screen in that program was done by sampling (recording) a toy foam baseball bat as it struck a metal delivery door at the Amiga plant. I also happen to know that the ST is simply not capable of making complex sounds like that, and sure enough, tucked quietly behind that 520ST, right next to its MIDI ports, was a CZ-101. Its power light was on. I made a couple of innocuous remarks to the Atari guy standing nearby (making sure he didn't see my badge) and when he said, yep, the ST could do everything the Amiga could, I grinned and said, "Then you won't mind if I turn this synthesizer off, will you?", and reached for the CZ-101. I didn't make it, but as I was being escorted from the booth by two Atari guys, one on each elbow, it occurred to me that that's **REALLY** power without the price! (And you thought trade shows were dull affairs!)*

-Peggy

Chester proving their worth to Commodore in the face of the challenge from the new tech wizards at Commodore/Amiga in California. We don't think they've got anything to worry about; there's plenty of room for both in the marketplace for awhile.

3.5 DRIVE

Commodore has some peripheral products slated for introduction in 1986, and many of them are pretty exciting. Both the **GenLock** and **Frame Grabber** will be introed for the Amiga this summer, and we still await the **Mouse** and **RAM Expanders** for the C128 (apparently now shipping but in short supply). Now Commodore also says they'll be shipping a 3.5 disk drive for the C128 later this year. No word yet on capacity or price, though we would expect about 880K and less than \$300 (Amiga compatible?).

HOME COMPUTER PURCHASES

According to the respected computer industry weekly **Computer & Software News**, the end of 1985 saw Commodore far and away still the most popular home computer, with almost as many Commodore computers in homes as Apple and IBM combined. Their year-end consumer survey says that 29% of the home computers out there are Commodores, 17% are Apples, and 14% are IBMs. Altogether the Big Three account for 60% of the installed base of home computers. Tandy came in fourth at 10%. Atari's share was less, but they didn't specify by how much.

The **C&SN** survey also reported on consumers' intent to buy a personal computer. Interest in personal computer purchases near Christmas time was double that of a year ago, with about 12% of the households surveyed indicating they were in the market for a home computer. Of those, 24% said they were leaning toward an Apple, 20% toward IBM, and 12% were thinking of buying a Commodore. Only 2% indicated an interest in purchasing a Tandy computer, with less than 1% saying they planned to buy an Atari. However, a third of those surveyed were still undecided about their brand preference.

Along the same lines, Commodore's top

management is projecting record sales in 1986. Figures being tossed around in-house indicate record-breaking sales of 3 million units for the venerable Commodore 64, one million C128s, and an unspecified number of Amigas. That's over **four million** Commodore computers in just one year. Compare that to the four million total number of MS-DOS machines on the planet.

LINCOLN COMPUTER CAMP

Plans for LC4 are coming together for yet another year (see **Computer Camp: or How I Spent My Summer Vacation** in issue #9). According to Dan Gauwitz at Lincoln College, camp will be held from July 6-12 this year. Each day will consist of three classes instead of two, plus a different lecture each evening. Among the instructors lined up for this session are: Jim Butterfield (Machine Language, Special Topics), Dick Immers (Disk Handling), Jim Grubbs (Telecommunications), Steve Michel (Databases, File Handling), Doug Wall (Interfacing), and Jim Tucker (Hardware Hacking). [Tucker, by the way, was the Hardware Guru who taught last year, not Stu and Buck as I reported last issue. Sorry, Jim.] One more instructor has yet to be lined up. At LC4 you'll have fun, learn a lot, meet some nice people, and you can even get one or two college credits for attending. Cost of the full week is \$280. Rooms can be had in the dorms (highly recommended for the late night Bull Sessions) for \$10/nite. Meals for the week at the cafeteria will set you back another \$52. You can bring your own computer (SX-64s are highly recommended) or rent a C64/1541/monitor for \$80 for the week. Registration deadline is April 15, and your registration form needs to be accompanied by a \$150+meals deposit. For more INFO, call the Special Programs Office, Lincoln College, Lincoln IL 62656 (217) 732-3155. You won't regret it--LC4 is a five-star event.

DISK INSURANCE

Have you ever worried about what would happen if both your original and your backup data disks crashed at the same time? (You do back up important disks, don't you?) If you

have some really critical data that you just can't live without, you might want to consider saving it on a Polaroid diskette. Not that a Polaroid disk is necessarily better than anybody else's, but they do offer a very unique form of data insurance. They have a free data recovery service that can take a damaged Polaroid diskette and recover most of your data, no matter what abuse it has taken. According to their ads, this includes smoke, spills, dust, bends, holes, and just about anything else you can think of. It's better to just be careful, but since accidents do happen...

COLLECTING

We're going to make a prediction that the biggest antique fad by the turn of the century is going to be collecting early high-tech items like the first calculators, video games, and computers. If you have an old PET 2001, or the first TI LED four-banger calculator, **Hang Onto It!** It might help you put your kid through college. High-ticket items will include things like the original Apple I single-board computer, Altair computers, the first programmable Hewlett-Packard calculator, and the Magnavox Odyssey I and Atari Pong home video games. Full-size arcade versions of classics like Pong and Space Invaders will sell high, too. Original releases of computer and game machine software like Visicalc and Mystery House in their original Apple versions will also be valuable. Low serial numbers will sell for more. Repair parts for the early machines will be in short supply then, too, so a stock of IC chips like the 6502 CPU and the TTL glue chips that tie a computer together will be in big demand among collectors. Even dead machines will sell well as sources of repair parts. And, of course, related magazines like the first **Creative Computing**, **BYTE**, or **INFO** will be priceless. Remember, you read it here first.

PLUS/4 UPDATE



It looks as though Commodore is finally throwing in the towel on the Plus/4; they have stopped the Plus/4 assembly lines. Recent Ronco-style ads on cable TV are offering the Plus/4 for \$99.95, and C.O.M.B. has it for \$79.

Commodore itself is offering closeouts on its Plus/4 software titles in the pages of **Commodore Microcomputers** magazine. Typical offerings range from games like **Maze Mania** on tape for \$12 to the **Calc Plus** spreadsheet on cartridge for \$45.

1520 REVISITED

The 1520 plotter, discontinued by Commodore some months ago, is going for about \$50 on the closeout market. If you have always wanted to play with a plotter, the 1520 is a nice little unit for quickie drawings, and it can print the smallest program listings you've ever seen, if you are willing to wait for them. It's not a professional plotter, but it is a lot of fun. Replacement pens and paper are the same as those Radio Shack sells for their mini-plotter. Software compatible with the 1520 includes **Flexidraw**, **CAD-3D**, **COMAL**, and **Commodore LOGO**, among others.

COMPUTER SHOPPER

Glenn Patch's **Computer Shopper** is the Penny Saver of the microcomputer business. Every month, it features display and classified advertisements for just about everything associated with just about every aspect of computing. More than that, under Stan Veit's editorial guidance it has become a great editorial resource, too. Don Lancaster, of **Popular Electronics** fame, has a monthly column. Stan, who was in on the ground floor of the industry, has a continuing **History of Microcomputing** column that is a real **You-Are-There** experience. Regular sections cover the latest in Apple, IBM, Commodore, Tandy, and even CP/M, TI 99/4A, and Sinclair computing! If you've got \$2.25 left over after buying **INFO**, you could do a lot worse than to invest it in a copy of the **Shopper**. On the newsstands, or 18 bucks a year from: **Computer Shopper**, 407 S. Washington Ave., PO Box F, Titusville FL 32781.

THE RUMORS OF OUR DEATH....

Well, we don't claim to be 100% on top of things. We alluded to the death of **MSD** last issue, but it seems that they are alive and well

in Texas. The source of their rumored demise seems to be the fact that they have pulled back from marketing their C64-compatible disk drives through dealers, and are selling them instead direct by mail. Their excellent SD/2 dual drive goes for \$434 plus \$10 shipping, COD or prepaid. They also offer the SD/1 single drive for \$200+\$10 shipping. If you need service for an existing MSD drive, they will provide that by mail, too. Their number is (214) 357-8587, or write MSD, 10031 Monroe Dr, Suite 312, Dallas TX 75229.

THINGS WE'D LIKE TO SEE

SMOOTH SCROLLING

Listen up, software authors! Benn has asked me to preach for a moment on the virtues of smooth scrolling. The VIC chip in the Commodore 64 and C128 has provisions for marvelous smooth scrolling, but we hardly ever see it used for text. Many arcade games use smooth scrolling for the playfield motion; the technique is even easier to use for text. Midwest Micro produced a program long ago called '64 Terminal that used smooth scrolling and the ease it gave to the eyes was incredible. (Fast Hack'Em uses it on its parameter copier menu, too.) That's why high-end dedicated terminals like the VT-100 use the technique. We need wordprocessors and terminal programs and spreadsheets and database managers, et. al., that use this incredibly subtle and utilitarian capability of the VIC chip. A wedge into the operating system that would turn it on full-time would be a very welcome programmer's utility, too.

CONSTRUCTION SET

With the abundance of Construction Set type programs on the market right now, it's amazing that nobody has come up with a Calculator Construction Set. This program would let you build special-purpose on-screen calculators for real estate, scientific and engineering applications, finance, etc. You could program function keys for specific formulas, and even include up to, say, 255-step programmability. You could set number of decimal places, RPN or parenthetical operation, and even number

bases. A really good program would even let you get into complex numbers. It could let you program actual keyboard keys to correspond to the on-screen display functions, or let you use a joystick or mouse to click on the screen display keys. An option for simultaneous multiple register display would be nice, too. You could provide for paper tape output to the printer, or to a file for use in other programs. There should, of course, be ample preconstructed calculator parts to pick from, as well as several pre-built calculators on the disk. Considering that a single good special-purpose calculator still sells for \$40.00 or more, there should be a good market for Calculator Construction Set.

SON OF CONSTRUCTION SET

While we're on the subject, where are the electronics and logic gate construction sets? You could manipulate and assemble logic diagrams or electronic components on-screen to breadboard circuits, then have the computer turn on the simulated juice to see if they worked. Not worrying about blowing out your ICs would certainly help alleviate experimental anxiety for the budding electronics whiz, and might even encourage the old pro to try some things differently. Ample sample designs would help beginners see how to get started. These programs combined with the right Learn Along manuals would be sure winners.

FREWARE

Ned Schultz, 1415 13th St., Los Osos CA 93402, is offering a copy of a freeware disk containing 8 BASIC programs for the Commodore 64 to anyone who sends him a blank disk and return mailer with postage. If you like the programs he'd appreciate a \$5.00 donation. The titles include 'Square of Fortune', based on the TV game show, and a space shoot-em-up game. All programs are listable.

A disk cataloging program called Disk Librarian V2.2 is being offered as fairware by A. J. Kwitowski, 302 Euclid Avenue, Glassport PA 15045. A quick look-through indicates it's a pretty good all m/l program capable of tracking up to 127 disks. A.J. is asking owners

who find his program useful to submit \$4.00, which entitles them to updates and info, plus a utilities disk which allows the sorted printing of your library files for just \$2.50 to cover the cost of the disk and postage. I assume he'd probably make a copy of the Librarian for you, too, if you sent \$2.50 for a disk and postage. (Don't be cheap--add the \$4.00 donation while you're at it.)

The first substantial Freeware effort we've seen for the Amiga is an incredible Mandelbrot Set program from Robert S. French, 2740 Frankfort Ave., Louisville KY 40206 (502) 897-5096. (If you don't know what the Mandelbrot set is, check out the August '85 issue of Scientific American.) This program produces some marvelously colorful and addictive displays, and is very well-thought-out and fast: see the Amiga Gallery section in this INFO for a breathtaking sample color screen shot. Early versions of the program (with some bugs) are up on several BBS systems around the nation, including ARPANet. The author has offered to make copies of the latest debugged and improved version 2.1 for anyone who sends a blank 3.5 floppy and return mailer. If you appreciate Robert's efforts, send along a \$10.00 contribution to the cause.

If you have a freeware offering, or know of one, send along a copy to INFO and we'll let our readers know about it.

COMMODOORE CD-ROMS?

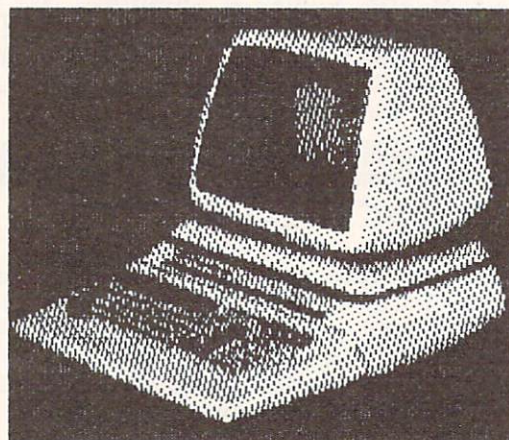
Phillips has announced that they will be producing CD-ROM units with a built-in generic controller and interface. The CM-110 will only require a simple interface and proper driver software to work with almost any computer system, including Commodores. The new interface electronics will allow a computer to access up to seven of the 600-megabyte CD-ROM units at once. The units will be available commercially by the third quarter.

NAAUG

If you are an Amiga user looking for assistance and comradery, check out the North American Amiga Users' Group, PO Box 376, Lemont PA 16851, (814) 237-5511. \$25 annual dues gets you the newsletter *AmigaHelp*, a BBS, a free public domain disk, access to their PD library, and group purchase discounts.

B128 MOVIE STARS

If you were keen of eye, you may have caught a half-dozen or so of the discontinued pedestal-model Commodore B128s starring in the computer room scene in the film *Jewel of the Nile*. As far as I could see, they weren't listed in the film's credits anywhere.



Best supporting computer?

C USERS GROUP

While we're on the subject, The C Users' Group, PO Box 97, McPherson KS 67460, provides a newsletter, BBS, public domain library, and moral support for C programmers for \$15/year. Though C128 CP/M users can get Osborn CP/M source disks directly, last we heard C64 and Amiga C users are not directly supported by the group's library.

WHAT SLUMP?

Despite a much-publicised downturn in the personal computer industry, the Software Publishers Association reported third-quarter '85 sales were up 18.7% over the previous year. They were expecting similar encouraging figures for fourth-quarter sales.

ACTIVISION BUILDS EMPIRE

In the first quarter of 1986 Activision has acquired Gamestar and Infocom, after having enveloped Creative Software late last year. The Gamestar move was not entirely unexpected, since Activision has been producing and marketing Gamestar's titles for over a year and a half. But Infocom is an old name in the business. Apparently hurt by the failure of their IBM-PC database program **Cornerstone** to make any headway in the marketplace, Infocom found a \$7.5 million saviour in Activision. The Infocom offices will remain in Cambridge. One assumes that they will concentrate on doing what they do best: interactive fiction.

AMIGA SALES

Commodore's Amiga sales are building rapidly after a slow start. Commodore announced sales of just 35,000 Amigas in 1985, but 10,000 in Jan 86 and 20,000 in February. Among the customers for the Amiga so far are:

Universal Studios, apparently intent on using the Amiga in music video production work.

Ohio State University, where they have outfitted their prestigious Computer Graphics Lab with 17 Amigas. The added capacity provided by the new machines has allowed them to open the facilities to undergraduates for the first time.

Miami Vice, which will use the Amiga as the centerpiece of an upcoming show.

The US Navy, which was impressed with the possibility of using the Amiga as a color radar display terminal. (Under development by a third party is a Landsat downlink interface.)

COMP-USED

Need a place to buy or sell used computer equipment but don't know where to go? You might check out **Comp-Used**, a computer equipment exchange run on automated telephone equipment. There is no charge to the buyer, except for an SASE for the current list of equipment in any one category (a full list is \$9.00). The seller pays a 6% commission on a successful sale (\$20 minimum) up to \$5000, and

3% thereafter. The minimum value of an item to be listed is \$100. Among the items listed currently are 200 pristine new Amigas from an overstocked dealer. Comp-Used's number is (203) 762-8677.

NETWORK SHAKEOUT

It looks like the nets are undergoing their first shakeout. Viewtron has "gone dark", as they say in the telecommunications business. And Commodore is pulling out of **QuantumLink** and returning to **CompuServe**, which will probably have the same effect on **QL**. This leaves **PlayNet** as the only one of the "pretty nets" (meaning with graphics) left. Meanwhile, **CompuServe** is still the biggest, and still growing, with over 250,000 subscribers.

AMIGA SUPERBASE

Precision Software has announced that **Superbase** for the Amiga will be available within a couple of months. This is especially good news for two reasons. (1) We have yet to actually see a single database manager for the Amiga, so we're glad to see the very best Commodore database being ported to the very best Commodore computer. **Superbase** should sell a lot of Amigas, especially to Commodore upgraders. (We can't wait to get our files moved over!) (2) Precision had announced earlier that the Amiga version of **Superbase** would have to wait until the Atari ST version was finished. But when they discovered how difficult the ST is to program, and that it would take months longer than they had estimated to produce **Superbase** for the ST, they scrapped that project and switched over to the Amiga version. The Amiga is proving so easy to work with that they are already weeks ahead of schedule with the Amiga version. With the fast-building numbers of Amigas being sold, Precision has high hopes for **Amiga Superbase**. We're sure that other quality software publishers will be discovering the Amiga in the same manner.



A-TIME

continued from pg. 69

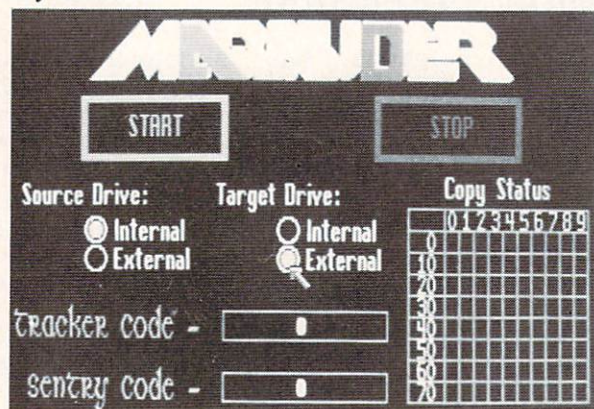
The A-Time works well, and keeps good time, but we ran into one difficulty. If you boot up a CLI or Workbench without the A-Time support modules installed and then access the printer, you can garble the time. It is easily reset, and the printer continues to work normally, but this is an aggravation that is not made clear in the instructions. If you install the A-Time, just make sure you install the support modules on all your disks.

A-Time real-time clock is \$49.95 from:
Akron Systems Development
PO Box 6408
Beaumont TX 77705



Well, it was bound to happen: the Copy Protection Wars have begun for the Amiga!

Marauder, from Discovery Software, is a copy program for the Amiga that will duplicate most copy-protected commercial programs verbatim. The version we have is a beta-test copy, but the final version should be very similar.



On booting up, Marauder displays a 'piracy-is-wrong' warning, then lets you go on to the main screen. There you are presented with a colorful title, two buttons to click on to select source and destination drives, two code entry boxes, and a copy-status display matrix. If you just want a byte-for-byte copy of an unprotected disk (something which is impossible under AmigaDOS), you select source and destination drive numbers and click on the start box. The beta version requires two drives to work, but the final version should also support single-drive copying with swaps. After inserting your disks, the status display begins to show you which tracks and blocks it is copying. The whole process takes just a couple of minutes. The result is a 100% Xerox copy of the original.

Except for some initial problems in getting the beta version booted up, Marauder has done an excellent job of making working copies of all the programs we've gotten in so far for the Amiga, and the final version with updates should see us through for quite awhile.

If you are copying a protected disk like *Deluxe Paint*, you have to first enter two numbers, the Tracker and Sentry codes. These are provided on the disk in the beta version in notepad note form which you can dump to the printer. The codes on the final version are said to be menu-selectable with the mouse, and come on a disk file which can be user-edited to update or change entries. These codes are generally different for each protected disk. So, much like *Fast Hack'em* for the Commodore 64, Marauder will be capable of copying any protected program for which Discovery has been able to deduce the codes. Periodic updates will, of course, be available.

Marauder, an indispensable tool for anyone with an Amiga, is \$39.95 from:

Discovery Software
262 S. 15th St.
Philadelphia PA 19102
(215) 546-1533



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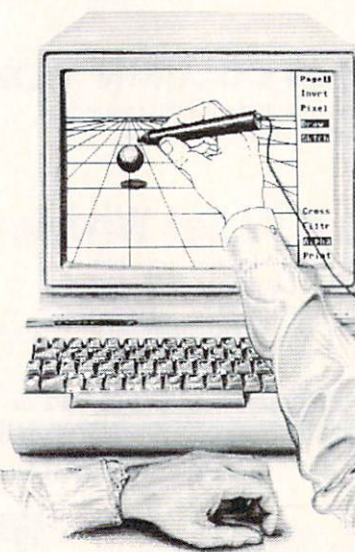
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The Winner:

Now that the deadlines and extensions have all passed, here is the winner of INFO's "Computer Room We Arbitrarily Like Best" contest, from issue #8:

STEVE BARD
Seattle WA

for his custom-built computer center. As you can see, his computer room is equipped with a couple of Commodore computers, a couple of off-brand computers, a stereo, floodlights, a statue of Cupid, and a time bomb security system. Congratulations, Steve!

RUNNERS UP:

Don Grangruth
Auburn WA

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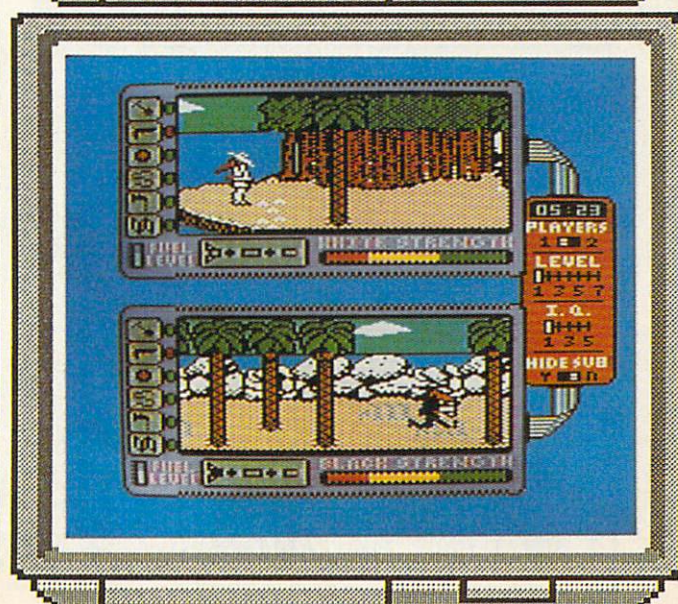
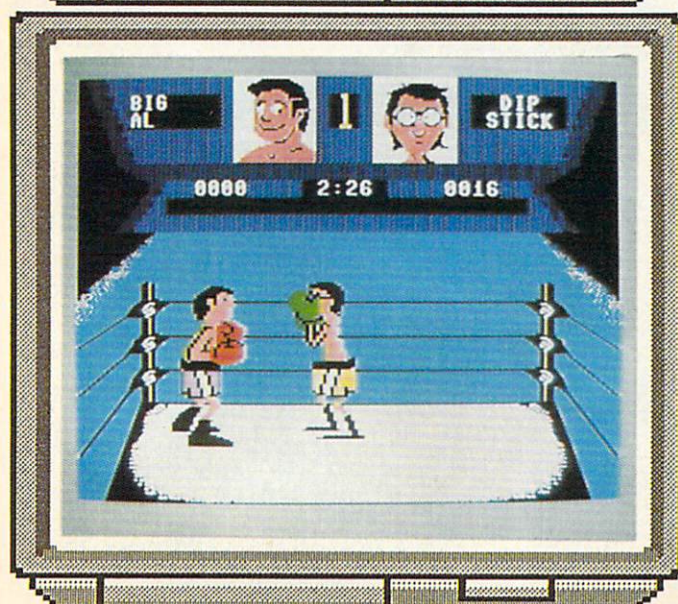
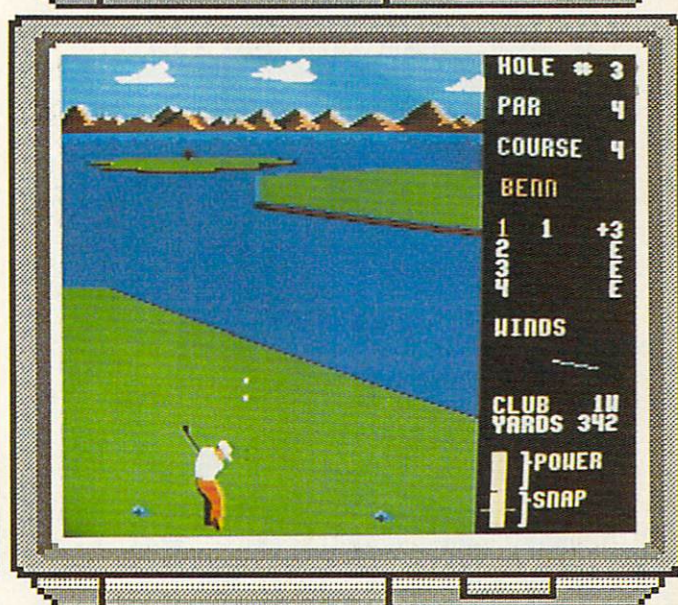
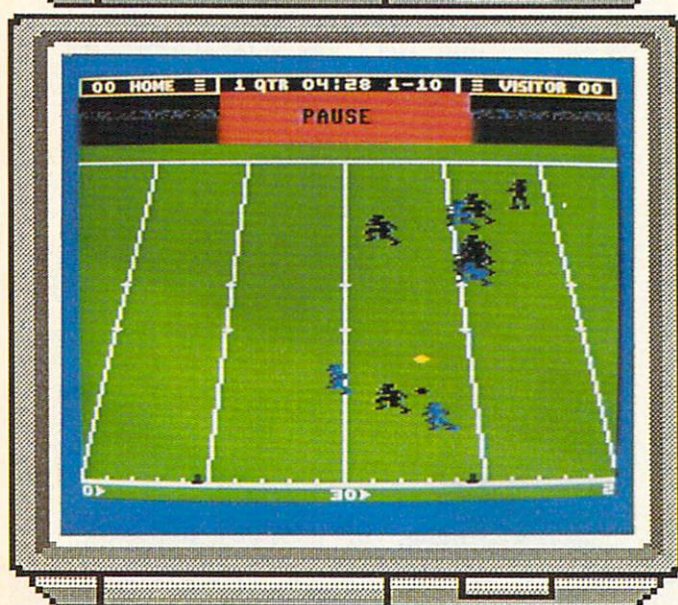
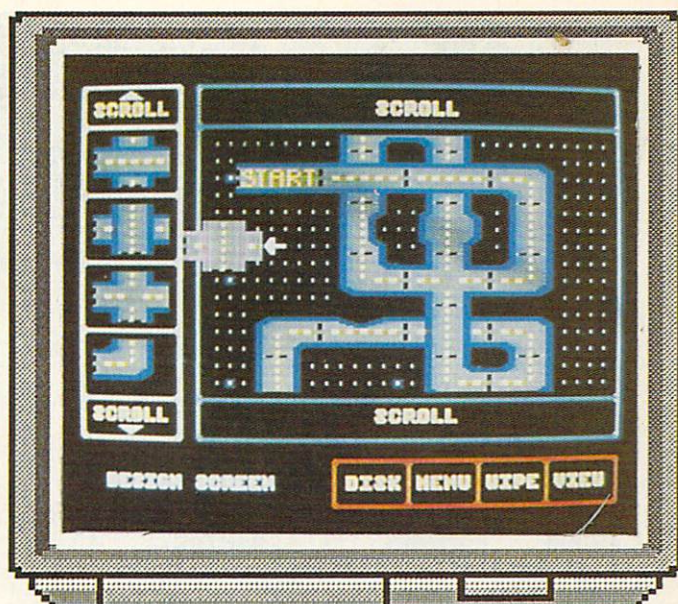
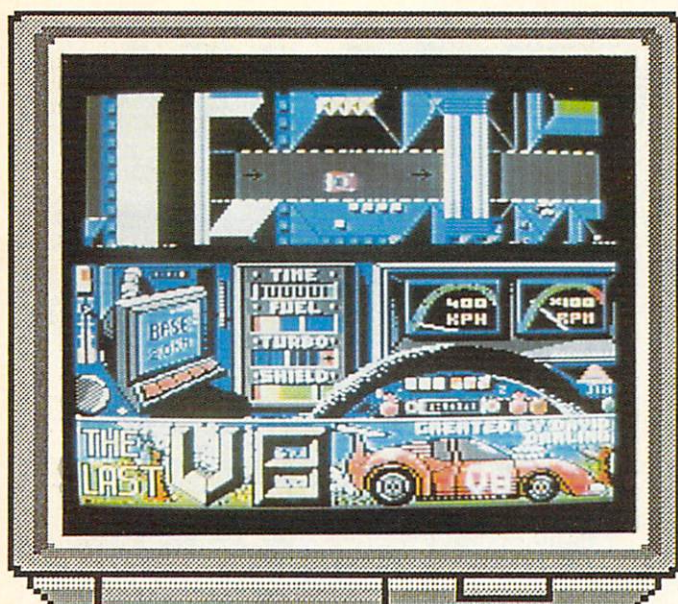
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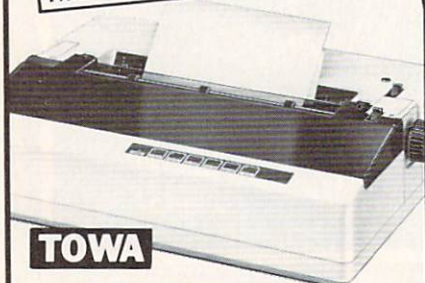
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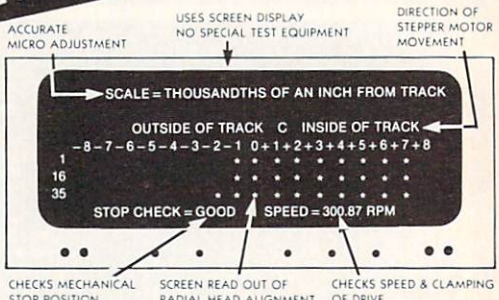
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INFO 64 Magazine, Issue #7

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RUN Magazine, June 1985

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Commodore Microcomputer, Sept/Oct 1985

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Both Vizawrite and Vizastar are written in 100% machine language and run in the 128's FAST mode, making it lightning fast. They require a C128 with 80 column color or monochrome monitor. Both come with a cartridge, a diskette, and a reference manual. Vizastar also includes a 50 page tutorial book. Both work with 1541 or 1571 disk drives.

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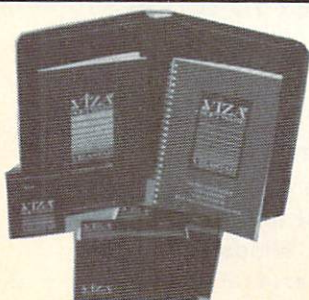
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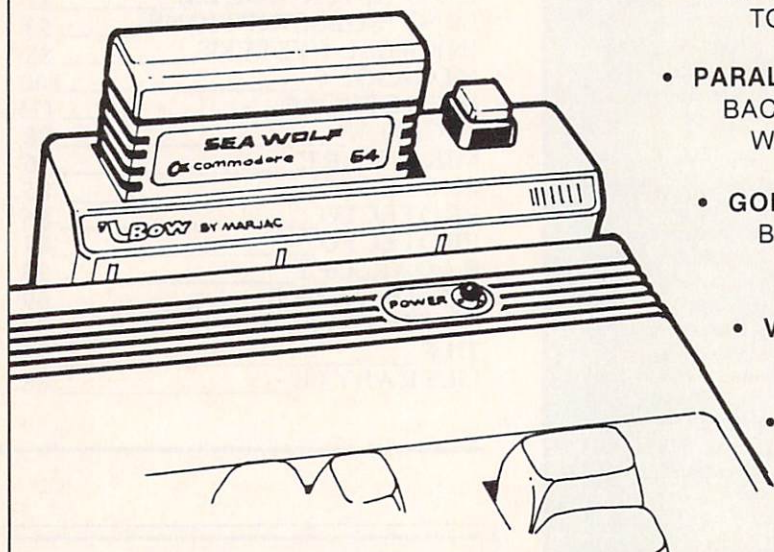


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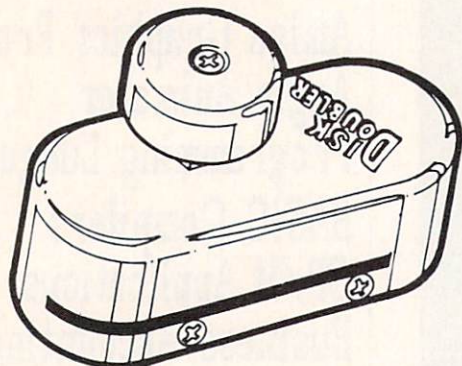
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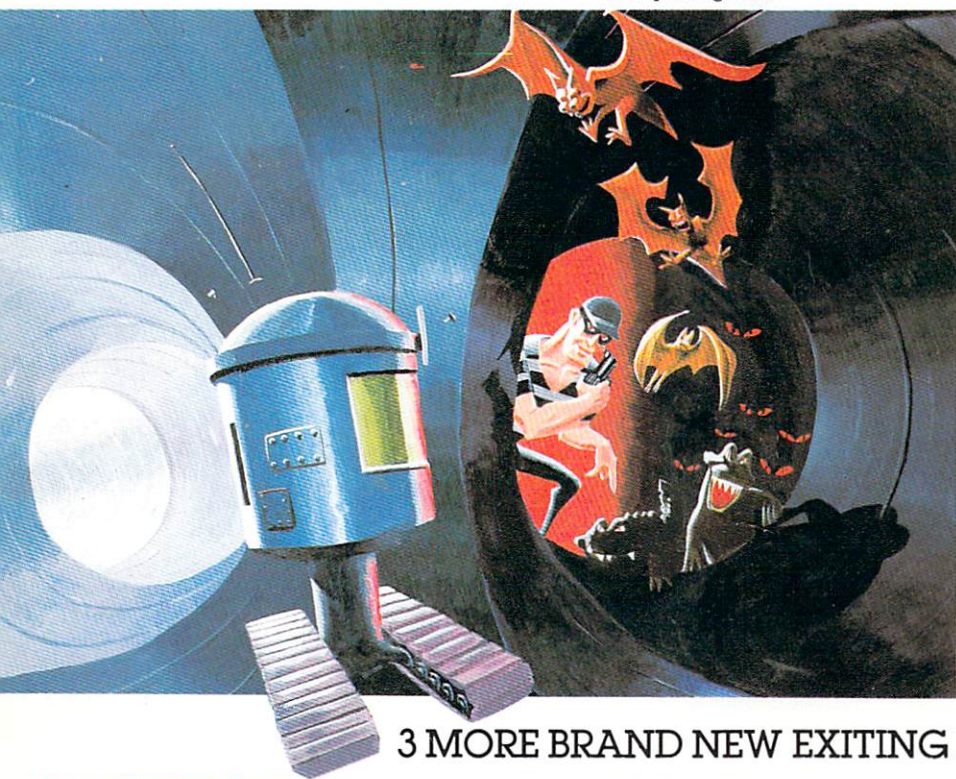
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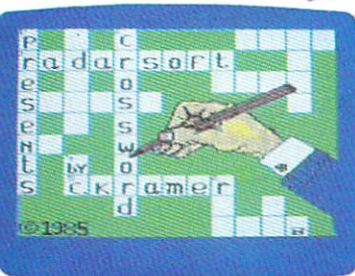
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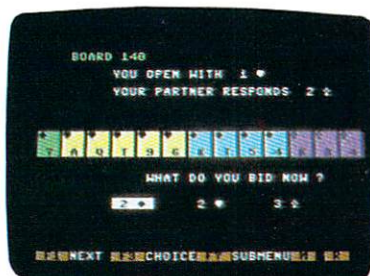


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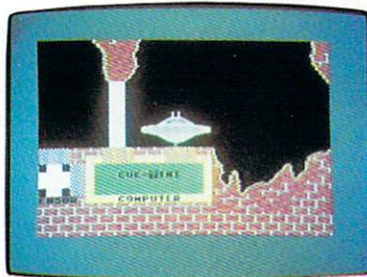
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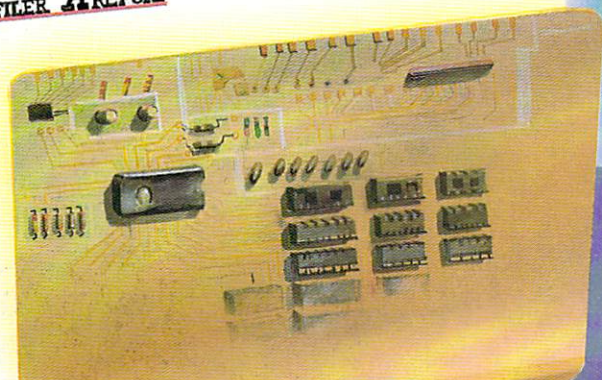
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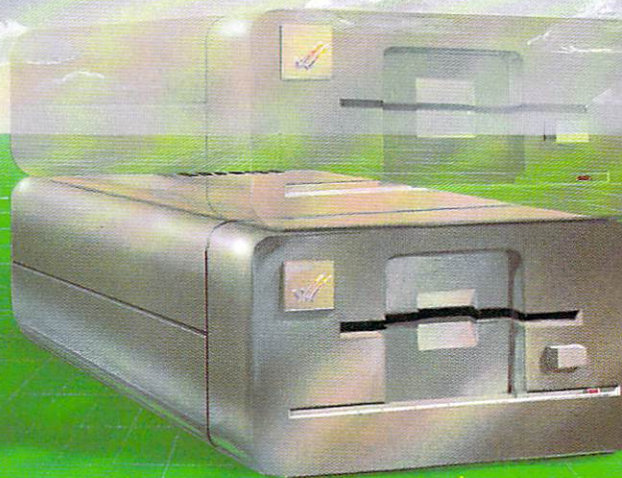


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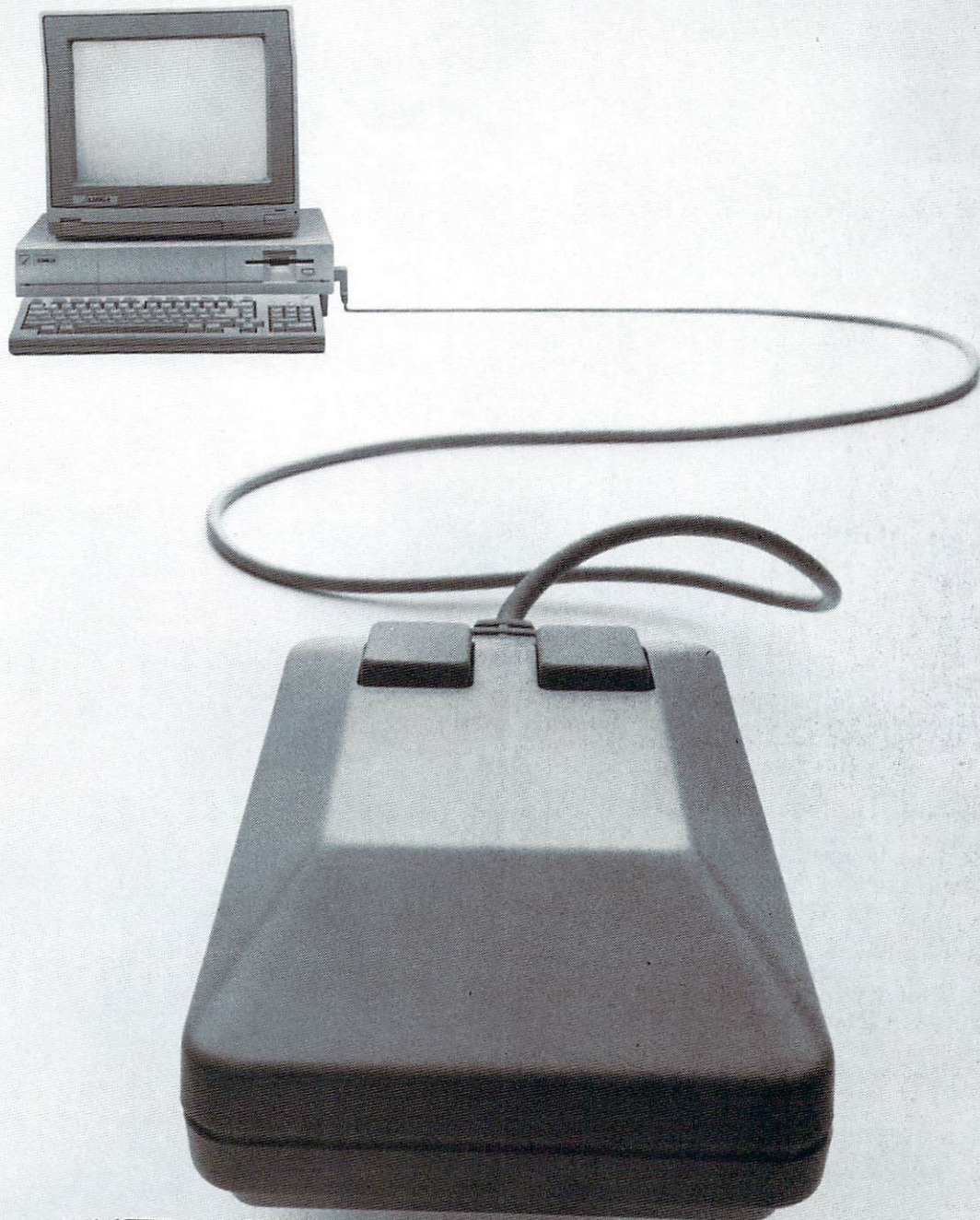
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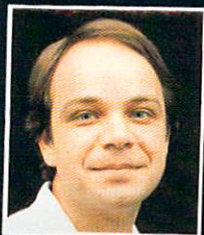
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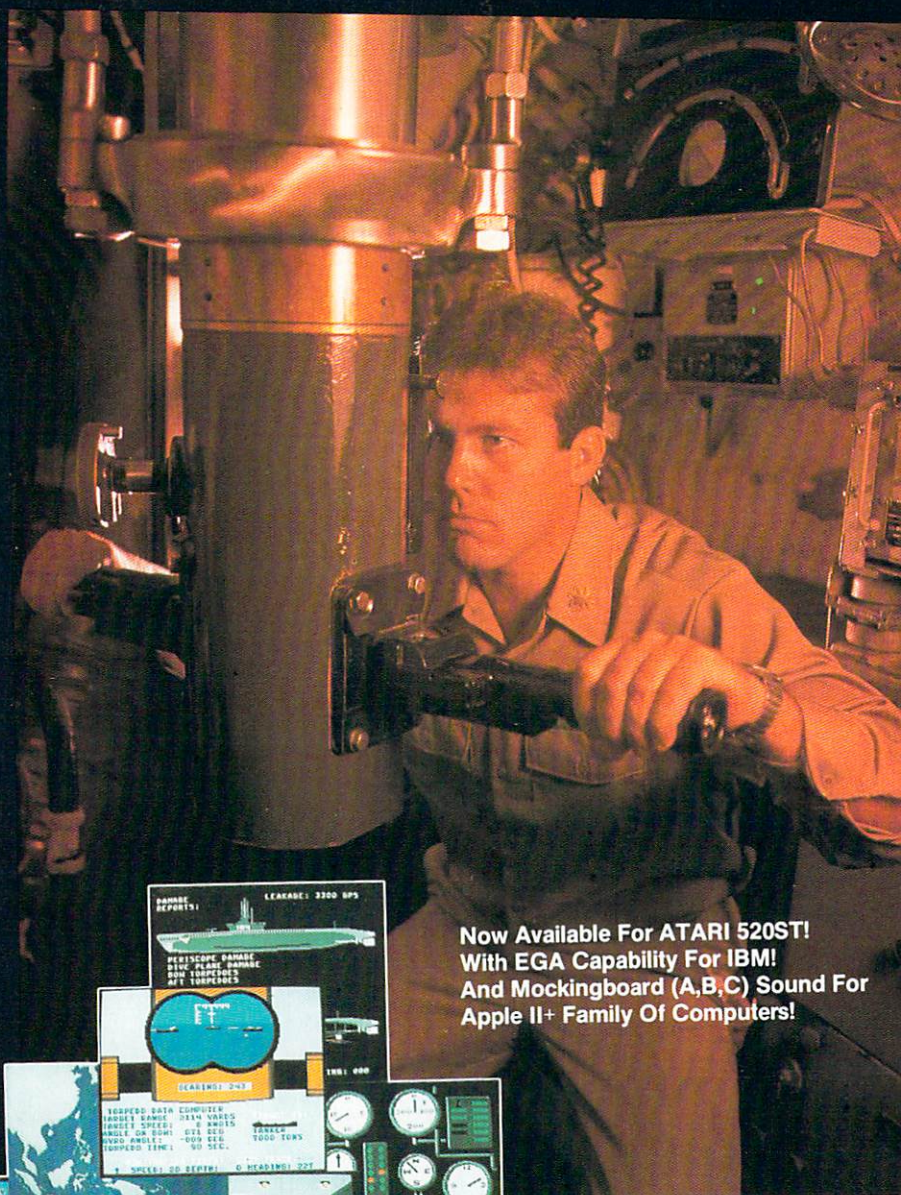
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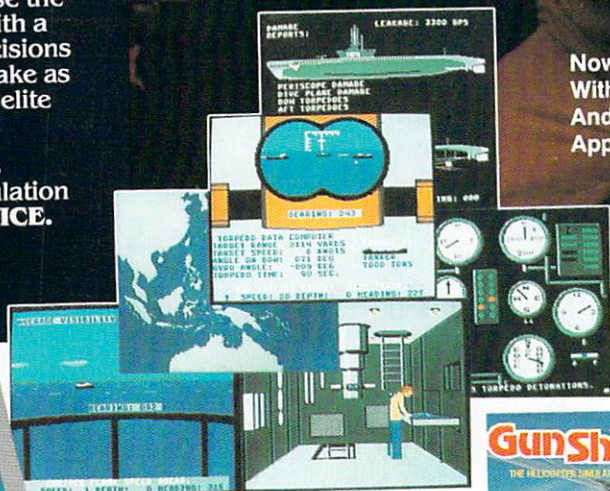
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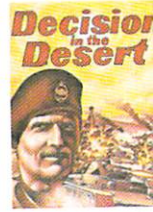
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